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OCTOBER, 1886.

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## SOPHORA SPECIOSA, *Benth.*

BY MORITZ KALTEYER, PH. G. and WILLIAM E. NEIL, PH. G.

(Condensed from two Inaugural Essays.)

This evergreen shrub is a native of Texas and New Mexico, flourishing on rough rocky hill-sides, and avoiding the rich black soil of the prairie. Near Matagorda Bay it is a small tree about 30 feet in height; near San Antonio it attains the height of 6 or 8 feet, and grows in patches, intermingled with the mezquite, often clinging to the edge of a ledge of rock with large portions of the roots bare and exposed to the heat and cold of many summers and winters, and by its long tap-root enabled to withstand the frequent droughts. The trunk is tough, crooked and rough, with a gray-brown thin bark, and with hard and heavy yellow wood, which in some localities is called *lignum vite*. The leaves are impari-pinnate; the leaflets in 3 to 5 pairs, about  $1\frac{1}{2}$  inch long, obovate or oblanceolate, obtuse or emarginate, entire, reticulate, dark-green and glossy above, and paler beneath. The showy flowers appear in February and March, grow in racemes, and have a blue-purple papilionaceous corolla, ten distinct stamens and a strong fragrant odor. The fruit is indehiscent, more or less moniliform, often curved, grayish-pubescent, and contains from 1 to 8 seeds. The seeds are roundish-ovate, about  $\frac{1}{2}$  inch long and  $\frac{3}{8}$  inch thick; the testa is hard, brittle, somewhat granular, dark-red or sometimes yellowish, and marked from the slightly flattened hilum by a longitudinal ridge. It contains a thin layer of firm whitish albumen, and an embryo of the shape of the seed, with two white, rather concavo-convex, cotyledons and a short radicle bent at a right angle. The average weight of the seed is 20 grains, that of the kernel about 12 grains, and of the integuments 8 grains. The seed is inodorous, and the taste bean-like and somewhat bitter. Though known to be poisonous, and hence



SOPHORA SPECIOSA, Benth.

Flowering branch, fruits, seeds and embryo.

called *poison-bean*, it is largely used by boys in the place of marbles.

Mr. Bellinger, of Texas, states that the Indians in the neighborhood of San Antonio used the seed as an intoxicant, half a bean



producing exhilaration, followed by sleep lasting two or three days, and it is asserted that a whole bean would kill a man.

Some years ago (see AM. JOUR. PHAR., 1878, pp. 33 and 283), the seeds attracted attention through the investigation of Dr. H. C. Wood, who isolated a poisonous alkaloid, *sophorine*. Both Mr. Kalteyer and Mr. Neil found the alkaloid in the testa and in the kernel.

Mr. Neil obtained 3.2 per cent. of ash from the whole seed; Mr. Kalteyer 3.1 per cent. from the kernel, and 7.6 per cent. from the integuments; the former contained chloride, phosphate and a trace of sulphate of potassium, calcium and magnesium, while in the latter phosphate and chloride of potassium and calcium, with a trace of manganese were found.

For proximate analysis the integuments and kernel were used separately; from the description given it seems that the layer of albumen was added to the embryo by Mr. Neil, and to the testa by Mr. Kalteyer.

Mr. Neil's results were as follows:

	Testa.	Kernel.
Extracted by petroleum benzin,.....	5.60	18.200 per cent.
“ “ ether,.....	lost	.153 “
“ “ absolute alcohol,.....	1.26	1.860 “
“ “ distilled water,.....	12.00	26.500 “

The alkaloid was found in the alcoholic extracts; slight traces of it were also observed in the other extracts from the kernel. The specific gravity of the yellowish red fixed oil, obtained by benzin from the kernel, was determined to be .889; it was insoluble in alcohol, but freely soluble in ether, chloroform and carbon bisulphide. The presence of sugar was determined by Fehling's solution in the water extracts. As far as examined, the other constituents agree with those determined in the following analysis.

Mr. Kalteyer's results are tabulated as follows:

	Percentage from	
	Testa.	Kernel.
By petroleum spirit: Saponifiable fixed oil, sp. gr., .912,.....	1.300	21.050
By ether (resin or wax),.....	.100	trace
By alcohol: Phlobaphene,.....	1.000	2.610
Alkaloid, organic acids (tannin in testa) and other organic substances,.....	2.350	7.540
By water: Inorganic salts,.....	1.000	2.300
Mucilage,.....	4.150	1.500

Albumin,.....	—	1·750
Dextrin,.....	1·900	2·200
Organic acid and coloring matter,.....	6·900	6·000
Soluble Arabic acid?.....	1·050	6·573
By caustic soda : Mucilage and Albuminoids,.....	1·200	9·070
Not precipitated by acetic acid and alcohol,.....	3·700	4·250
By hydrochloric acid : Parabin,.....	3·750	6·450
Lignin,.....	6·876	4·380
Insoluble residue,.....	55·084	14·945
Moisture,.....	9·575	7·500

The coloring matter of the testa was not taken up by petroleum spirit or ether, but was freely soluble in alcohol and in alkali; it is precipitated by lead acetate, and using alum as a mordant, gave a light pink-colored dye.

The alcoholic extract was treated with water, the solution precipitated with lead acetate, treated with sulphuretted hydrogen, and both acid and alkaline, agitated with solvents; the alkaloid was taken up by chloroform from the alkaline liquid, and seems to be present in larger proportion in the testa than in the kernel. An aqueous solution gave with potassio-mercuric iodide a bulky white, and with gold chloride a crystalline yellow precipitate. Sulphuric acid and potassium chromate produced at once a muddy brown color, rapidly changing to light green, which slowly faded. Sulphuric acid gave a light flesh-colored solution; ferric chloride only a perceptible darkening.

## PRELIMINARY ANALYSIS OF THE LEAVES OF JUGLANS NIGRA.

BY LILLIE J. MARTIN.

Read before the American Science Association.

So far as I have been able to ascertain no chemical study of *Juglans nigra* has been made. Certain constituents of *Juglans* are given, but the disregard of botanical requirements makes it impossible for those unacquainted with the constituents of this plant to tell whether it is this particular species. So meager are the descriptions of the mode of obtaining the various products, and their properties when found, that it is doubtful whether even a chemical study would settle the question. Unfortunately, giving a name to some substance is not giving the most minute description of it.

The leaves used in this work were picked from a fine black walnut tree in July. Sections were immediately cut and a superficial micro-

chemical examination made. Chlorophyll, oily matter, resin, probably tannin, albuminoids, starch and crystals of calcium oxalate were recognized. The leaves used in the chemical study were gathered at the same time and after being kept for five days at ordinary temperature were ground in a mill and put through a number eighty sieve.

The moisture determination made upon two grams at a temperature from 100° to 110° C. showed 8.45 per cent. The same portion was incinerated in a porcelain crucible for four hours. The odor given off during incineration was peculiar, something like fresh leather. It was of the same nature as many of the odors observed later on in the work. It was thought a volatile alkaloid might be present, but distillation with milk of lime failed to show it. The ash was of a gray color and amounted to 8.49 per cent. Qualitative analysis gave the bases calcium, magnesium, potassium, and iron. Watts' dictionary says that walnut leaves, no species given, contain aluminum, but none was found. The acids hydrochloric, sulphuric, phosphoric, silicic and carbonic, were identified.

Dragendorff's Plant Analysis was used as a guide. With petroleum spirit (boiling 25°–45°C.), Squibb's ether and absolute alcohol, two determinations were made—one upon 10 grams in Tollen's apparatus by hot extraction from 10 to 11 hours, the other upon fifty grams by cold maceration for seven or eight days, the bottle being frequently shaken, and the solvents replaced every other day.

Hot maceration gave 3.50 per cent. for the petroleum spirit extraction. Cold maceration gave but 3.00 per cent. In each case by raising the temperature to 120°C. there was a slight loss of weight. 0.20 per cent. was the loss in the amount obtained by hot extraction. By treating a quantity of the original powder with water acidified with sulphuric acid a sweet smelling liquid, having an oily substance floating on top, was obtained. The oily substance had the general action of an ethereal oil, giving up its odor and evaporating when heated. The oil doubtless passed off as the petroleum spirit evaporated. The liquid obtained in connection with the oily substance was acid. Tests showed that sulphuric acid had not been carried over. There was then a volatile acid in the plant. It was not acetic acid. It gave yellowish white precipitates with neutral and basic lead acetate and a white crystalline precipitate with barium carbonate.

The petroleum extract was fluorescent, blood-red by reflected and green by transmitted light, showing the presence of chlorophyll.

Extract was slightly acid in reaction. The residue was a greenish yellow, black colored, soft solid and had a melting point of  $55^{\circ}\text{C}$ . It had a peculiar odor. It was entirely soluble in absolute alcohol, being reprecipitated by water, the precipitate was disseminated through the liquid. 95 per cent. alcohol separated the substance into green and yellow material and then nearly dissolved it. Chloroform, benzol and carbon bisulphide dissolved the residue, the last solution giving a characteristic reaction by reason of its becoming red in color. Dilute sulphuric acid did not affect the residue. Concentrated sulphuric acid turned one part of residue brown and the other green; when water was added to this the whole dissolved. Dilute nitric acid separated a green substance from petroleum residue. Boiling concentrated nitric acid gave a floating oily substance. This was filtered and water and strong ammonia added to the filtrate—a precipitate of floating red particles was obtained, showing the presence of resinous matter. Neither ammonia, solutions of borax, chloride of lime, nor chloride of antimony affected the petroleum spirit extract. The same may be said of hot and cold aqueous solutions of sodium hydrate. Hot alcoholic solution of caustic soda dissolved most of residue, and after long boiling produced something resembling saponification.

No results were obtained on testing for alkaloids.

So far as studied the petroleum spirit extract seems to be made up of chlorophyll, perhaps a free fatty acid, volatile oil, resin and a fat of the higher acid series, or a wax.

The residual powder was dried at the ordinary temperature until the odor of petroleum spirit disappeared, and then Squibb's ether was added. Hot maceration gave 8.90 per cent. Cold maceration 3.66 per cent. extract. A loss of .08 per cent. was observed on raising the temperature to  $120^{\circ}\text{C}$ . The ether extract was fluorescent and gave a neutral reaction. The residue was a glossy black amorphous solid and had the odor of fresh leather. The residue was entirely soluble in carbon bisulphide and chloroform, but was not crystallized out of these solvents. Benzol and acetic ether dissolved but a part of residue. Sulphuric acid turned it green, when sugar was added no change was observed. Part of ether residue was soluble in water. Gelatin showed tannin to be present in the aqueous solution. It is to be regretted that Squibb's ether has sufficient alcohol left in it to remove tannin. The tannin was removed from the water solution of the ether extract by lead acetate, the lead by hydrogen sulphide, and the hydro-

gen sulphide by boiling. The filtrate was then tested for glucosides but none were found. Various tests seemed to indicate the presence of an alkaloid but the precipitates given were due I suppose to tannin. Certainly agitation with petroleum spirit, benzol and chloroform failed to bring to notice either an amorphous or crystalline residue. The portion of ether residue insoluble in water was treated with absolute alcohol. Nearly all was soluble in cold absolute alcohol and the part remaining dissolved on boiling. The portion of ether residue in water and cold absolute alcohol was not dissolved by aqueous nor by alcoholic solutions of potassium hydroxide.

The ether extract was composed of chlorophyll, tannin and resin. The material left after the extraction was dried at the ordinary temperature until the ether odor had nearly disappeared, and then absolute alcohol was added. Absolute alcohol removed 10.20 per cent. by hot extraction. .70 per cent. of this was ash, giving an organic extract of 9.50 per cent. Cold maceration took out 8.58 per cent. Extract was fluorescent and acid in reaction. The residue was a sticky, black, amorphous solid, and had the odor of fresh leather. Part of the residue was soluble in water. Tannin was found in this. A measured quantity was precipitated by lead acetate. An equal amount of fresh portion by acetate of copper. The lead threw down more matter than the copper. This looked as though something besides tannin was present. In testing for alkaloids only those tests gave reactions that would have done so by reason of the presence of tannin. The water solution from the alcoholic residue was acidified with sulphuric acid, and successively shaken with petroleum, benzol and chloroform. After the chloroform had been removed by petroleum, the solution was made alkaline and shaken as before. The alcoholic residue that was left after treatment with water, was treated with water acidified by sulphuric acid and agitated as before. Microscopic crystals appeared in all the residues. These were examined with much interest. Even if these minute crystals have nothing to do with alkaloids or glucosides, they are not therefore to be despised. Have they not in times past kept up the courage of the investigator longing to discover a new alkaloid while he went through the tedious process of searching for it? Besides these .001 m m diameter crystals, there were others that could be readily seen by the naked eye. They were obtained from the aqueous solution by agitation with acid petroleum spirit, and were accompanied by coloring matter. This amorphous and crystalline residue, blackened



under sulphuric acid and left little residue on platinum. It did not blacken ferric chloride; it reduced Fehling's solution; it gave no reactions with Mayer's solution, triiodide of potassium, cadmium iodide, gold or platinum chloride. It must then be glucosoidal in nature.

That part of alcoholic residue insoluble in water alone, in water acidified by sulphuric acid and in ammonia, was found to contain resin.

Chlorophyll, tannin, a glucoside, coloring matter and resin, were found in the alcoholic extract.

The water, acid and alkaline extractions, were made only upon the residual powder from the ten grams. Treatment was continued for about three days, the solvents being replaced daily and the portions filtered off preserved by adding a little alcohol.

Residue after treatment with alcohol, was dried at a little above ordinary temperature until alcohol odor had almost disappeared, and then treated with cold water. The water extract amounted to 14.50 per cent., the ash was 2.00 per cent., making organic extract 12.50 per cent. The green and pink particles in the ash were very noticeable. The water extract had the color of port wine. Residue was brown in color and odorless. Nitrogen was found in it. Tests showed all the tannin had been removed. An aliquot part of extract was mixed with two volumes of alcohol and allowed to stand twenty-four hours. The precipitate obtained was washed with alcohol and then dried. It gave 3.20 per cent. of which .80 per cent. was ash. This precipitate was dark brown in color, almost wholly soluble in water to mucilaginous liquid, and reduced Fehling's solution. Part of the filtrate from the gum precipitate was evaporated to a syrupy consistency and four volumes of alcohol added. A slight precipitate proved that a trace of dextrin and other carbohydrates were present. The filtrate from this precipitate reduced Fehling's solution. Fehling's solution applied to a measured portion of the original water extract gave 1.14 per cent. glucose. As was anticipated by the results above, the same quantity of water extract after being boiled with sulphuric acid did not give an appreciable greater amount of glucose.

An aliquot part of the filtrate from the gum precipitate was concentrated and afterwards precipitated with neutral lead acetate. The precipitate amounted to 9.80 per cent., of which 6.00 per cent. was lead oxide. The organic acids and allied substances amounted to 3.80 per cent. An unsuccessful attempt was made to identify the acids. The

water extracts contained mucilage, glucose, organic acids and allied substances and albuminoids.

Dilute caustic soda solution was applied to the residue after extraction with water. Whole caustic soda residue equalled 12.20 per cent., ash 7.40 per cent., organic residue equalled 4.80 per cent.; both extract and residue were brown in color and odorless. A measured portion of the extract was acidified with acetic acid, 90 per cent. alcohol added and this was allowed to stand twenty-four hours. .80 per cent. mucilaginous substance, albuminoids and ash were found. The filtrate from this precipitate was evaporated to dryness, and a substance almost entirely soluble in water, but not precipitate by alcohol, was found. Nitrogen was present in this substance. The alkaline extraction showed mucilaginous substances and albuminoids.

After one washing, very dilute hydrochloric acid was added to residue. It extracted 14.82 per cent., 5.32 per cent. of which was ash, and 9.50 per cent. organic matter. The amounts of starch and calcium oxalate which the microscope had shown to be present, were not obtained.

The residual powder was bleached with chlorine water to extract lignin, etc.; cellulose, etc., remaining.

#### SUMMARY:

##### I.—The quantitative results were as follows:

a. From Ten grams by Hot Extraction.		b. From Fifty grams and Cold Maceration.	
Moisture,.....	8.45 per cent.		
Ash,.....	8.49 "	Organic Petroleum Spirit	
Organic Petroleum Spirit		Extract,...	3.60 per cent.
Extract,...	3.50 "	" Ether,.....	3.66 "
" Ether,.....	8.50 "	" Absolute Alcohol	
" Absolute Alcohol		Extract.....	8.58 "
Extract,..	9.50 "		
" Water,.....	12.50 "		
" Alkaline,....	4.80 "		
" Acid,.....	9.50 "		
Total,	65.64		

Comparison of these results shows that as far as the work was carried, cold maceration gave a smaller extraction than hot. This was, probably, mainly due to a difference in the amount of chlorophyll taken out. Hot extraction tending to throw the chlorophyll forward. More time for cold extraction would have increased the amount of extract, doubtless, for when at the end of each extraction a new portion

of solvent was added and a little afterwards evaporated on platinum foil, a decided residue remained. This proved that the seven or eight days maceration suggested by Dragendorff does not exhaust this plant. For relative results this time may be sufficient.

II. The qualitative results in (a) the two preliminary microchemical examinations gave similar results. Four bases, calcium, magnesium, potassium and iron. Five acids, sulphuric, hydrochloric, phosphoric, silicic and carbonic. Also, chlorophyll, volatile oil, a volatile acid, resin, a fat of the higher acid series or a wax, tannin, glucoside, mucilage, organic acids and allied substances, glucose, albuminoids, lignin and cellulose; of these tannin seems to be the controlling principle in the plant.

(b) The preliminary microchemical examination gave chlorophyll, resin, probably tannin, albuminoids, starch, calcium oxalate, lignin and cellulose. It will be observed that about half as many substances were identified by the microscope as by putting the plant through a regular course in proximate analysis. This number is sufficiently large to emphasize the value of a preliminary microchemical examination of any plant taken up for study, since it furnishes information that enables one to work to better advantage. The information too that might be obtained as to the position of the various compounds in the plant, would be valuable. In that case, however, the mode of procedure would be different. It would then be necessary to make sections of the plant, and treat them as the powder is treated, making similar tests at every step. While the microscope is of much value in chemical work, it can in its present state of perfection, in no way supply the place of a careful chemical examination. It bears the same relation to the preliminary proximate analysis of a plant, as the general tests that precede the regular qualitative examination of a substance in inorganic chemistry.

This work was done in the chemical laboratory of the PHILADELPHIA COLLEGE OF PHARMACY, during July, 1886.

**Oxalic Acid as an Emmenagogue.**—M. V. Poulet (*Gaz. hebdom. de méd. et de chir.*, May 14, 1886), has used oxalic acid for amenorrhœa from various causes, and regards its effects as marvelous, including an amelioration of the pain in cases of dysmenorrhœa. He gives it according to the following formula:

Oxalic acid.....	2 parts.
Warm water.....	200 "
Syrup of bitter-orange peel.....	60 "

A teaspoonful is to be taken every hour.—*N. Y. Med. Jour.*

## ON BUCHU AND OIL OF BUCHU.

By R. SPICA, PROFESSOR AT THE ROYAL INSTITUTE OF VENICE.

Translated and abridged from *Annali di Chim. Med. Farmac.*, 1885, p. 233,  
by Joseph W. England, Ph. G.

In 1827 Cadet de Gassicourt (*Jour. de Pharm.*, xiii, 106) found that 100 parts of buchu leaves contain 0.6 to 0.8 parts of an ethereal, yellow oil, lighter than water, 21.17 parts of gum, 5.17 parts of extractive, 1.1 parts of chlorophyll and 2.15 parts of resin. Brandes (*Arch. Pharm.*, 1827, xxiii, 229) prepared, besides the ethereal oil, etc., a glutinous, amorphous substance, soluble in water, chemically allied to colocynthin and cathartin, which he called diosmin. Bedford obtained from the leaves of *B. serratifolia*, 0.66 per cent. of volatile oil and from *B. crenata* and *B. betulina* 1.21 per cent. Landerer (*Buchn. Repert.*, 1830, xxxiv, 63), by extraction with alcohol, found a crystalline body, insoluble in water, to which he gave, also, the name diosmin. Jones, (*Pharm. J. Trans.*, 1879, ix, 673) determined the quantities of ash in these several species to be from 4 to 5.5 per cent., containing a large quantity of manganese, and by successive treatment with solvents, ascertained that 3.8 to 5.86 per cent. was soluble in ether, 7.7 to 15.7 per cent. in alcohol and 13.9 to 22.38 per cent. in water. Wayne (*AM. JOUR. PHAR.*, 1876, p. 18) found that the ethereal oil, treated with caustic soda, and then with hydrochloric acid, gave crystals, which he claimed were salicylic acid. Flückiger, whose researches (*J. Pharm.*, 1880, ii, 404 and *Pharm. J. Trans.*, 1880, No. 533, p. 219) are very important, made his experiments upon *B. betulina*, using the ethereal oil obtained from 35 kilograms of leaves, (180 gm. of oil), from which he secured a solid crystalline body, fusing at 83° C., boiling at 233° C., which he called diosphenol, and ascertained the chemical formula to be  $C_{14}H_{22}O_3$ ; also, an oil isomeric with borneol  $C_{10}H_{18}O$ , boiling at from 205° to 208° C. J. M. Maisch, finally, studying the ethereal oil of *B. betulina*, (*AM. JOUR. PHAR.*, 1881, p. 331), confirmed the data of Flückiger and disproved Wayne's statement concerning the presence of salicylic acid, which, while sometimes present, was thought to be due either to fermentation or to the presence of other leaves among the buchu examined.<sup>1</sup>

<sup>1</sup> In the translator's opinion, if the results of Prof. Spica, be accepted, the more probable theory would seem to be, that salicylic acid does not pre-exist in the leaves; but since a portion or all of the elæopten and the stearopten is of phenylic origin, that that portion is decomposed, first, by the added soda, to form sodium salicylate and then, by the hydrochloric acid, to form salicylic acid,

*Extraction of Volatile Oil.*—The leaves in a finely powdered state, were distilled until no more oil passed over. The oil was lighter than water and left, while floating upon the surface of the liquid, prismatic crystals. The aqueous distillate contained a feeble acid, whose chemical nature together with that of the residual, strongly acid, brown liquid remaining in the retort, will be further examined. In order to obtain a larger quantity of the volatile oil, the process of extraction was modified and repeated upon more material. The powdered leaves were macerated with ether for three days, when the liquid became green in color from dissolved chlorophyll. The larger quantity of ether was then distilled off, while the balance was evaporated, spontaneously, and the oily residue distilled with steam, until no further oil passed over. Every 1000 parts of leaves yielded about 6.5 parts of a greenish yellow oil, having a grateful odor, similar to peppermint and bergamot, and lighter than water. Separated from the water and desiccated over fused calcium chloride, a portion was fractionally distilled. The greater part passed over between from  $200^{\circ}$  to  $235^{\circ}$  C., and the last portions were manifestly decomposed and gave a different and rather more phenol-like odor than the first. In order to ascertain if the first fractions contained substances soluble in potassium hydrate, a small quantity of the mixed fractions was agitated with KHO, in strong solution, after which separation into two parts took place. Using a second quantity, with a more dilute solution of KHO, it became evident that the KHO solution was not as sensibly colored, as in the first instance. The insoluble part (elæopten) was then separated, washed with water and desiccated over fused calcium chloride, while the aqueous washings were added to the KHO solution and the remaining elæopten was removed by agitation with ether. The alkaline solution was then treated with hydrochloric acid until slightly acid, when a precipitate formed which, after several minutes, assumed a crystalline aspect. The supernatant liquid was removed and the residue agitated with ether, the ethereal solution evaporated at a low temperature, when the stearopten crystallized in the form of long, flat needles, slightly impure from adhering brown oil.

*Examination of the Elæopten (Diosmelæopten).*—It is a greenish in a similar manner to oil of wintergreen, when that liquid is treated with the same reagents. Further, it is shown, that only in neutral solution, does the stearopten possess its characteristic mint-like odor, and any change in this characteristic, must necessarily indicate some change in chemical composition.



yellow oil of grateful odor and constitutes about two-thirds of the volatile oil. It has a pungent, cool, aromatic, and finally, sweetish taste. Desiccated over fused calcium chloride and then distilled, it fractions very irregularly. The first fraction (*a*) very small in quantity, came over at from  $180^{\circ}$  to  $200^{\circ}$  C., the second (*b*) at from  $200^{\circ}$  to  $203^{\circ}$  C., the third, the largest in quantity, at from  $203^{\circ}$  to  $206^{\circ}$  C., the fourth (*d*) at from  $206^{\circ}$  to  $209^{\circ}$  C., the fifth (*e*) at from  $209^{\circ}$  to  $211^{\circ}$  C.; leaving in the retort a small yellowish-brown residue. Repeating the distillation, after having reunited the more abundant fractions, there was obtained a portion boiling at from  $204^{\circ}$  to  $206^{\circ}$  C. (not corrected). This fraction constitutes a perfectly colorless, mobile liquid, lighter than water, having the odor and taste before mentioned, and when subjected to ultimate analysis, gave H 12.00 and C 77.66; while the portion boiling at from  $209^{\circ}$  to  $211^{\circ}$  C., yielded H 12.19 and C 77.48. This points to the elementary formula  $C_{10}H_{18}O$ , isomeric with borneol, which, in 100 parts contains H 11.68 and C 77.92. The portion boiling at from  $204^{\circ}$  to  $206^{\circ}$  C. corresponds better, in its results, with this formula, while the higher boiling fractions probably contain compounds less carburetted, and inversely.

The determination of the vapor density was made by Meyer's method, upon the portion boiling at from  $204^{\circ}$  to  $206^{\circ}$  C., and conduced to the formula  $C_{10}H_{18}O$ , but the substance decomposed at the temperature at which the vapor density was taken.

*The Action of Sodium upon the Elaeopten (Diosmelaopten)*, resulted in the formation of a brownish decomposition product. The addition of sodium was continued until decomposition ceased and water was then added. The brown semi-solid decomposition product was separated from the liquid by filtration through wetted paper. The filtrate was agitated with ether, then treated with more sodium, and acidulated with hydrochloric acid, which separated an oil having a thymol-like odor. It was extracted with ether, and the solvent evaporated spontaneously, when it distilled at from  $225^{\circ}$  to  $238^{\circ}$  C., and on fractioning the greater part boiled at from  $230^{\circ}$  to  $232^{\circ}$  C. This portion constitutes a light yellowish liquid, very dense, of the odor and taste of thymol and whose aqueous solution (it is slightly soluble in water) does not become colored on the addition of ferric salts. A combustion of this substance, gave H 9.62 and C 77.54, which points to the formula  $C_9H_{12}O$ , having in 100 parts H 9.67 and C 77.42. The determination of the vapor density by Mayer's process, led to the same formula.

The composition of this liquid, which has phenol-like qualities, would seem to indicate that it is a homologue inferior to ordinary camphor and until its true chemical character is better understood, it is proposed to name it dioscamphor.

*Examination of the Stearopten* (Diosphenol of Flückiger).—The crude stearopten, as previously obtained, was depurated from adhering brown oil by compression between dry paper and then crystallized repeatedly by dissolving in the smallest possible quantity of alcohol, then lightly heating, adding water, slowly, until a slight turbidity ensued, and cooling, when long, white, needle shaped crystals are formed, having a camphoraceous odor. Heated to  $82^{\circ}$  C. they sublime, partially, and commence to boil at about  $220^{\circ}$  C., when decomposition ensues. The diostearopten is slightly soluble in water, very soluble in alcohol or ether, and in neutral solution, has a mint-like camphoraceous odor. The alcoholic solution treated with ferric chloride, was tinged an apple-green and then, on the addition of more of the reagent, deepened into a bottle-green color. The hydrates of potassium and sodium dissolve it well, and from their solutions hydrochloric acid precipitates it in minute crystals. Carbonate of ammonium does not dissolve it. It acts, then, like a compound of phenol origin.

The analyses made give different results from those obtained by Flückiger, viz:

Obtained.		Theory.	
H	9.79	9.85	(F.) $C_{14}H_{22}O_3$ (S.) $C_8H_8O$
			9.24 9.52
C	71.65	71.44	76.58 71.44

Apparently, then, the buchu camphor is much more simple in its chemical structure, than the results of Flückiger would seem to indicate, it appears to be nothing more than an oxycamphor  $C_{10}H_{16}O_2$ . This product is perfectly identical in all the characteristics published concerning the diosphenol of Flückiger.

The determination of the vapor density, does not tend to establish the formula at  $C_{10}H_{16}O_2$  as the substance was decomposed during vaporization, but, in the future with more time and material, correct results will be sought for through another method, and the chemical relation will be ascertained between the diostearopten  $C_{10}H_{16}O_2$  and the liquid compound  $C_8H_{12}O$ . The former is probably a phenylic ether containing, also, one phenol hydroxyl.

Certain other compounds isolated, with alcohol, from the leaves after

the separation of the volatile oil, will also be investigated. One of these substances called *diosmin*, differs completely from the *diosmin* of Brandes, but may, perhaps, be identical with the *diosmin* of Landerer, although obtained by a new method of extraction.

## AN ANALYSIS OF THE UNDER-GROUND PORTION OF PHLOX CAROLINA.

BY HENRY TRIMBLE.

Read before the American Pharmaceutical Association in Providence, R. I.

This investigation was undertaken by Mr. S. M. Harrington, a student in the laboratory of the Phila. Coll. of Pharmacy, but after doing some of the preliminary work he had to relinquish it, and with his permission I began the investigation anew.

The scheme proposed by Dragendorff was used as the basis of the work, and I wish to state, in connection with this, that considerable objection has been offered to this method of plant analysis, as being too mechanical and only the blind following of another's plan. I reply that, when there is any reasonable ground for such criticism, it is the fault of the chemist doing the work and not of the method. A scheme of some kind is obviously necessary, and immensely better than a fragmentary examination for an alkaloid, glucoside, or some other new compound, without first determining all the important constituents. The method of Dragendorff has been found to be the most satisfactory of a number that have been offered, and the results will always show originality if that faculty has been exercised. The objection is as absurd as to question the analysis of a mineral by the use of hydrochloric acid, sulphuretted hydrogen and the other group reagents.

The following summary of results will afterwards be taken up in detail:

Moisture,.....	7.82	per cent.	
Ash,.....	16.70	"	
Camphor with red coloring,.....	1.00	"	Sol. in petroleum spirit.
Resin,.....	.44	"	" " stronger ether.
Tannin,.....	1.82	"	
Glucose,.....	.27	"	} Soluble in absolute alcohol, 9.96 per cent.
Saccharose,.....	.78	"	
Undetermined,.....	7.09	"	

Gum,.....	2.34 per cent.	} Soluble in water, 8.68 per cent.
Glucose,.....	.33 "	
Allied Sugars,.....	1.49 "	
Albuminoids,.....	4.52 "	
Albuminoids sol. in dilute alkali, ..	.99 "	} Sol. in dilute hydrochloric acid, 10.86 per cent.
Calcium Oxalate,.....	2.90 "	
Gum,.....	.36 "	
Undetermined,.....	7.60 "	
Volatile Acid, Butyric,.....	trace.	
Lignin,.....	5.53 "	
Cellulose and allied substances,....	36.65 "	
Total,.....	98.63 "	
Less calcium oxide in } calcium oxalate, }	1.19 "	
	97.44	
Loss,.....	2.56 "	
Total.....	100.00 "	

Of all these different portions, that soluble in petroleum spirit is the most interesting. The solution was red and fluorescent, and on evaporating the solvent the residue separated in fern-like masses of crystals on the side of the vessel, while that in the bottom formed into star-like circular masses of acicular crystals. These crystalline forms disappeared to a great extent on removing the mother liquor. The dry residue was treated with 66 per cent. alcohol to remove the red coloring matter, and the residue thus purified was crystallized three times from 95 per cent. alcohol, by using it boiling hot, and then twice from absolute alcohol, which left the compound in white, opaque, warty crystals in the bottom of the beaker, and the fern-like crystals on the side. The finest crystals were gotten by allowing the hot 95 per cent. alcoholic solution to cool slowly.

Fig. 1 shows such a crystallization in the bottom of the dish made up of a compact mass of acicular crystals supporting one another with the radiating growth around the base. Fig. 2 shows the same on the side of the vessel.

*Physical Properties.*—This compound has a slight aromatic odor but no taste, it is readily dissolved by chloroform and ether in addition to the above mentioned solvents. Its melting point was found to be 155.4° C. although further purification may alter this figure slightly. On heating a little above its melting point it sublimes. A transparent crystal causes a beautiful play of colors with polarized light.

*Chemical Properties.*—On heating above the melting point it ignites

and burns with a smoky flame. Bromine dissolves it readily exhibiting considerable chemical activity but very little heat. Concentrated sulphuric acid dissolves it with a brownish color, strong nitric acid slowly acts on it without decided coloration, and glacial acetic acid dissolves it readily, and from this solution water precipitates it. This

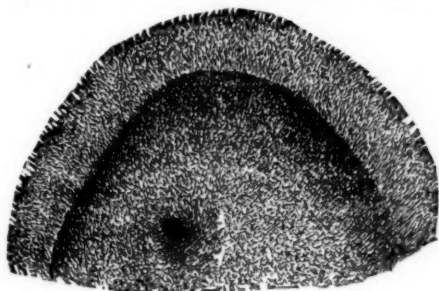


FIG. 1.

may prove to be a valuable method of purification. Concentrated solutions of the alkalis appear to have no effect.

In view of all these properties, this compound is considered to belong to the camphor group, and according to the custom of naming, *Phloxol* is suggested to designate it.

Spigelia was also treated with petroleum spirit, but no such compound was obtained; this solvent, therefore, immediately suggests itself

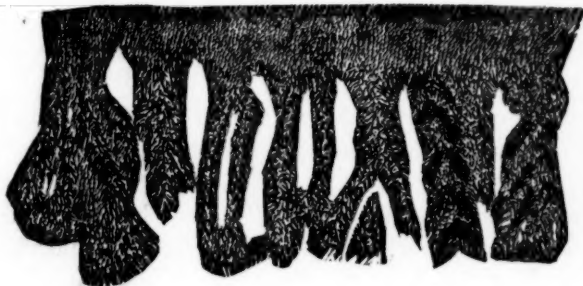


FIG. 2.

as a means of distinguishing spigelia from phlox. For the two drugs in the normal condition the physical appearance is sufficient. The fluid extracts or other liquid preparations could not thus be distinguished, because dilute alcohol which is employed as the solvent does not dissolve the camphor. It might, however, be used to distinguish the powders or mixtures of them.



I regret that the results of an ultimate analysis could not be included in this description. This, however, is reserved for another paper, because there have been discovered during the past year, in the same laboratory, two other new crystalline compounds which closely resemble this; one, in a bark from Honduras, by Mr. F. Holberg, for an account of which see *AMER. JOUR. PHARMACY*, May, 1886. The other was likewise discovered in a Honduras drug by Miss Helen C. D. Abbott, and an account of it read by her before the American Association for the Advancement of Science at its recent meeting in Buffalo. These three interesting compounds will be made the subject of another paper.

The ether soluble portion contained a small quantity of the red coloring matter which was found with the camphor. On evaporating the ethereal solution to dryness and treating with water, a solution was obtained which gave no indication of the presence of alkaloids or glucosides, but, on evaporation over sulphuric acid, a minute quantity of crystals formed which were not further examined.

That portion of the original drug which dissolved in absolute alcohol was found, after evaporating the solvent, to be completely soluble in water. It amounted to 9.96 per cent., of which 1.82 per cent. was tannin, 1.05 per cent. sugar and 7.09 per cent. undetermined. A separate determination of the tannin in the original drug by the gelatin and alum process confirmed the estimation of that substance. This tannin was found to be of the variety which forms with salts of iron a green color. The remaining solvents did not dissolve anything of especial interest.

Fifty grams of the original drug were distilled with milk of lime, but tests applied to the distillate showed the absence of a volatile alkaloid.

Another quantity distilled with dilute sulphuric acid furnished a distillate acid in reaction and unaffected by barium chloride or neutral lead acetate, but forming a white precipitate with basic lead acetate. The remainder of the distillate was treated with slight excess of pure barium carbonate, evaporated to small bulk and set aside over sulphuric acid to crystallize. The result was a small amount of crystals of the barium salt, which, on treatment with concentrated sulphuric acid, gave an odor strongly resembling butyric acid. This was not further examined as the amount present could not be considered more than a trace.

# GUARANA, METHODS FOR ITS ASSAY, AND THE ASSAY OF ITS FLUID EXTRACT.<sup>1</sup>

BY H. W. SNOW, PH.C.

In the *AMER. JOUR. OF PHAR.*, 1875, p. 135 is a method, proposed by E. S. Wayne, for the extraction of caffeine from tea and coffee, with the remark that it yielded very high results of a pure white alkaloid. Later on, F. V. Greene (*AMER. JOUR. PHAR.*, 1877, p. 337) applied the process to guarana, as a method of assay. J. H. Feemster (*Proc. A. P. A.* xxx., p. 569) more recently, has also recommended this method as a practicable assay process, and suited for pharmaceutical purposes. The criticism which the writer would offer upon it is chiefly the length of time required to complete the operation, but also as compared with the process to follow gives lower results indicating a less perfect exhaustion of the drug. In the boiling with litharge, several hours are consumed, which followed by filtration, washing, removing the lead, etc., extends the examination over the greater part of two days, and occasionally longer, and requiring considerable attention during the whole of that time. Any process then which can be begun late in the afternoon of one day, and finished easily in four or five hours the next day, would, all other things being equal, recommend itself to all who are engaged in making a number of pharmaceutical assays each day, but particularly would it be desirable when along with rapidity, we get a more perfect exhaustion of the drug. The process which the writer has to suggest is not new, except in its application to this drug, being the same as that proposed by A. B. Lyons, for the assay of *nux vomica* (*Drug. Cir.* 1886, p. 137) and which as applied to this drug is briefly described as follows:

Place five grammes of the drug in a small flask holding about 100 cc. or 120 cc., introduce 44 cc. of chloroform, cork and shake, then add 6 cc. of a mixture of alcohol, 6 volumes, and stronger water of ammonia 1 volume, again shake vigorously, and set aside with frequent shaking during several hours or allow to stand over night. Then filter rapidly through a small dry filter paper, four inches in diameter, and receiving the filtrate in a vessel graduated to 40 cc. (corresponding to 4 grammes of drug), evaporate the chloroform and treat the residue with a little water and filter through cotton, after-

<sup>1</sup>Presented to the Amer. Pharm. Assoc., in Providence, September, 1886.

wards passing the liquid through an ordinary filter and using the wash water of the first filter as wash water for the second filter. The washing should be continued until they cease to precipitate with phosphomolybdic acid. The operation of filtering and washing does not take much time and if the cotton filter clogs, it is easy to stir up the insoluble fatty or waxy matter, so as to permit the liquid to pass through. The aqueous liquid, which will usually measure 40 cc. to 50 cc. is next placed in a separator and washed with successive portions of chloroform, or until the aqueous liquid ceases to precipitate with phosphomolybdic acid. Two washings are generally sufficient, though the writer always applies the test before discontinuing the washing, and in fact it is always better for the operator, wherever possible, to assure himself by some such a test, that the alkaloid is all contained in the liquid supposed to contain it. The chloroform solution is now evaporated in a weighed beaker, and the residue dried at 100° C. for half an hour, cooled and again weighed. The weight in grammes multiplied by 25 gives the percentage of alkaloid. This process gives somewhat higher results than that of Greene, which in a sample of guarana showed 4.14 per cent., duplicate 4.28 per cent. The same drug assayed by the same process, showed by four different assays, 4.64 per cent. 4.66 per cent. 4.84 per cent. and 4.89 per cent. of caffeine. The writer also tried Prollius' fluid for the assay of cinchona barks, but without success. The same drug, as above, showing only 3.97 per cent. of alkaloid. In general, ether is not so well suited for the extraction of caffeine, as either benzol or chloroform, owing to the comparative insolubility of the alkaloid in that menstruum. Ammoniated ether and ammoniated chloroform were both tried for the extraction of caffeine from cola nuts yielding in the one case 1.34 per cent. and in the other 1.45 per cent of alkaloid, which did not, however, seem in such a pure condition as in the case of guarana.

In "The New Idea" the writer gave the results of a number of assays of fluid extract of guarana, which will probably be of interest here. The process employed was practically as follows: Evaporate 5 cc. of the fluid extract to dryness, with about one ounce of litharge powder, introduce into a flask of about 120 cc. to 150 cc. capacity, and pour in 100 cc. of chloroform, and shake repeatedly during three or four hours, and finally filter through a dry filter, containing some magnesia, which removes suspended particles of insoluble matter, which would be difficult to remove without some such device as the

magnesia. 80 cc. of filtrate (corresponding to 4 cubic centimeters of the fluid extract) are then evaporated to dryness, dried one half hour at 100° C., cooled and weighed. The weight in grammes, multiplied by 25, gives the percentage of the alkaloid extracted from the drug, and this percentage, divided by the specific gravity of the fluid extract, gives the percentage in the latter. The above gives results agreeing with those obtained in the same fluid extract by using Greene's methods slightly modified. Applying the above process to a number of commercial fluid extracts, results were obtained as shown in the following table:

No. of Sample.	Sp. Gravity. <sup>1</sup>	Per cent. of Alkaloid extracted from the drug.	Per cent. of Alkaloid in the fluid extract.	Grains of Caffeine in each fluid ounce.
1.....	1.0227.	2.70.	2.69.	12.35.
2.....	1.0182.	2.75.	2.70.	12.55.
3.....	0.9587.	2.72.	2.84.	12.44.
4.....	0.9947.	2.93.	2.94.	13.36.
5.....	0.9538.	2.99.	3.13.	13.67.
6.....	1.0409.	3.57.	3.42.	12.29.
7.....	0.9848.	3.40.	3.45.	15.51.
8.....	0.9797.	3.52.	3.60.	16.08.
9.....	0.9508.	3.70.	3.89.	16.88.
10 <sup>2</sup> .....	1.0515.	4.85.	4.61.	22.13.
Average.. ..	0.9856.	3.31.	3.33.	15.03.

"The National Dispensatory" (3rd edit. p. 366) credits E. Hosack, (1883), (the writer has not been able to consult the original paper) with the statement that commercial fluid extracts of guarana yielded only 1.10 per cent. to 1.68 per cent of caffeine, while it will be seen that the average of the above fluid extracts is 3.33 per cent. or practically, double the highest estimate given by Mr. Hosack. The experiments of J. H. Feemster, already referred to, show that guarana

<sup>1</sup> Specific gravity was taken at the temperature of the work room (26° C.) compared with water at the same temperature.

<sup>2</sup> This was a fluid extract which had evidently been standing for a considerable length of time in a nearly empty bottle, which probably accounts for its unusual strength.

assays on an average 4.32 per cent. so that the above fluid extracts fall considerably short of perfect exhaustion of the drug.

Later the writer has sought a process which should be more economical as regards time and chloroform, which in the process as originally applied requires considerable amounts. It suggested itself that the well-known power of slaked lime in removing organic matter from solution might be applied with good effect, and as a result the following process was found most satisfactory: 15 cc. of fluid extract are placed in a small flask, 30 cc. of distilled water are added and the mixture shaken up with two grammes of slaked lime, filter through a small dry filter paper, four inches in diameter, and taking 15 cc. of the filtrate (corresponding to 5 cc. of fluid extract) neutralize with a few drops of dilute sulphuric acid, avoiding an excess and evaporate to dryness, digest with a little water, filter, wash until the washing ceases to precipitate with phosphomolybdic acid, make alkaline with ammonia, wash with chloroform three times and evaporate etc., etc. This last method gives higher results than the first method given, and corresponds more nearly with the ammoniated chloroform process for the drug. The above processes all yield the alkaloid in a pure white mass, and though as yet no definite experiments have been performed to show that it is wholly alkaloidal, there seems little or no doubt that the mass is so.

Experiments to prove that this is absolutely the case, must be reserved for a future paper.

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## ON THE DETERMINATION OF MELTING POINTS.

BY HENRY C. C. MAISCH.

Read before the American Pharmaceutical Association, in Providence, R. I.

A pharmacist has many compounds of different properties to work with. A method for the determination of melting points used with one of these compounds may work well, while it can be used for few others. We must, consequently, adapt the method to each subject under consideration; thus phosphorus could be melted under water, but not on mercury, while the different camphors may be melted on the latter. From these remarks it can easily be seen that the best manner of treating the subject of melting points would be to class those articles together whose melting points could best be determined by the same methods. The headings under which I propose to con-



sider the different methods are as follows: Class I. Camphors, resins, waxes and alkaloids; Class II. Fats; Class III. Substances not readily oxidized; Class IV. Substances easily oxidized in contact with air.

Class I. *Camphors, resins, waxes and alkaloids.* A convenient and practical method, which I would advise being used for this class is the following: A small beaker is filled two-thirds full of mercury, into which a thermometer is suspended so that the mercury just covers the bulb of the thermometer. A small quantity of the article under examination is placed directly on the mercury and kept as close to the thermometer as possible. Heat is then gradually applied so that the rise of the mercury in the thermometer does not exceed two or three degrees, Fahrenheit, a minute. When the first indications of melting are visible, note the number of degrees and carefully regulate the heat so as to keep the temperature stationary at this point for a little time to see if the whole quantity will melt. If the article under examination does not melt completely, again apply heat very carefully until the whole quantity is melted to a transparent liquid. The temperature at which this takes place may be regarded as the melting or fusing point near enough for all practical purposes, though if greater accuracy is required it is first necessary to examine a body with a known melting point under the same conditions as are those when examining the body with the unknown melting point. We obtain thus the ratio of variation in this particular instance, and the required melting point can then easily be obtained from the given data. This comparison can be used in all subsequently named classes.

Class II. *Fats.* The above method can be used here also, but it will not give such satisfactory results as the following: A small, thin-walled glass tube is drawn out very fine, and the melted fat then sucked up into the tube, the capillary portion of which is then melted to a point. The part to be used is then laid aside for two or three days in a cool place. The tube is then attached to a thermometer by means of a rubber band, in such a manner that the capillary portion is as close to the bulb of the thermometer as possible. The apparatus is now placed so that the liquid, either water or sulphuric acid, just covers the bulb of the thermometer. Now gradually apply heat, being careful about the rise of the mercury in the thermometer. The melting point is that degree at which the fat becomes transparent. Another method is to have the capillary tube open below, and noting

the temperature at which the fat is pressed upward in the tube. This latter method does not give as accurate results as the former, some fats becoming very soft before they are entirely melted; but it can be used to good advantage in the determining of the melting points of some resins and waxes.

Class III. *Substances not readily oxidized.* The method given under Class I. can be used here, but only in such cases where no reaction takes place. Where this method cannot be used, we must resort to the sand-bath and a thin porcelain capsule. The temperature registered by the thermometer, if placed in the sand-bath, will be several degrees too high; as a correction we can use the comparison mentioned under Class I. Or the bulb of the thermometer is immersed in the material, which is slowly heated to liquefaction.

Class IV. *Substances easily oxidized in contact with air.* Sulphur, phosphorus, and other bodies which easily burn or oxidize, or in which there takes place dissociation or other chemical change when heated in air, must be melted in some liquid in which the article under examination is not at all or only very slightly soluble, and with which no chemical decomposition takes place. The best manner in which to apply this method, is to suspend a piece of the substance in the liquid, and keep the bulb of the thermometer as close as possible to it. This method has been tried by Gerardin (*Compt. rendues*, 1862, liv, 1082) with sulphur and phosphorus in different media, and he found the melting point to be invariably  $111.5^{\circ}\text{C}$  and  $44.2^{\circ}\text{C}$  respectively.

At various times descriptions of apparatuses for the determination of melting points have been published, of which the following may be briefly mentioned. Dragendorff (*Analyse der Pflanzen* 12, 13) does not apply heat directly to the beaker spoken of under Class I. He allows the rim of the beaker to rest on the top of a filter-dryer and covers the whole with a bottle, the bottom of which has been taken out. The thermometer is suspended through the neck of the bottle, and is there fastened by a cork. The whole apparatus stands on an iron plate, the filter-dryer being of such a height that the beaker does not rest on the plate. Heat is now applied gradually to the iron plate, carefully regulating the temperature.

Another form of apparatus has been described by Gustav Oldberg (*Rep. d. Anal. Chem.*, 1886, 94). The apparatus consists of two glass tubes of different diameters; a bulb is blown into one end of

the narrower tube, and the tubes are then connected above and below with each other by two glass tubes, the upper one being the widest and being attached somewhat slanting. The apparatus is then filled with water or some other liquid, so as to almost fill the upper connecting tube; a thermometer, with the subject under examination in a fine glass tube, is then adjusted so that the bulb of the thermometer is in the bulb of the apparatus. The liquid in the apparatus is then heated gradually in the wide, upright glass tube.

Authors differ very much in regard as to which point shall be taken as the melting point. F. Rüdorff (Pogg. Ann., 1870, cxi, 420) holds that the congealing and melting points are identical, and that the temperature at which the substance congeals shall be regarded as the melting point. Other authors opposed to the foregoing, hold that the congealing and melting points of certain bodies are at different temperatures.

In conclusion, I would like to make a few remarks as to the value of the melting points given in the Pharmacopœia. Melting points should not be given in the Pharmacopœia except in such cases where they are necessary for establishing the quality of medicinal articles, for example, acidum aceticum glaciale, oleum theobromæ, petrolatum, etc; the melting points of the various alkaloids and several other articles not being useful for this purpose, are entirely out of place. The Pharmacopœia should state the general effect of heat if characteristic for the drug; but it should only contain such melting points as will be necessary for testing the purity of the material, and all the rest should be left where they belong, viz, the text books.

### ULEXINE. A NEW BASE FROM ULEX EUROPÆUS.

By A. W. GERRARD, F.C.S.,

Teacher of Pharmacy, University College.

One of the most familiar plants in England is the leguminous shrub known to botanists as *Ulex europæus*, and to the country folk by the names furze, gorse, whin, etc. It is conspicuous on commons and roadsides, and is well known by its spiny branches and bright yellow flowers, either solitary or in pairs, situated on the spines.

The economic uses of the plant do not seem to be important. It is chiefly grown to provide shelter for young trees or cover for game; in some parts of the country the young tops are gathered and bruised as fodder for cattle. The seeds, which are an article of commerce, recently attracted my attention.

Twenty grams of the crushed seed was first exhausted with washed ether, to remove fat, and on evaporation 2.1 grams of greenish-yellow oil of bland taste was obtained. The seed was then exhausted with 84 per cent. alcohol, the tincture giving on evaporation 1 gram of brittle, pale greyish-green resin. On treating this residue with water and filtering, the filtrate was found to give precipitates with solutions of iodine in iodide of potassium and of the double iodide of potassium and mercury. The bulk of the liquid, after concentration, was shaken with ammonia and chloroform, and the residue obtained on evaporating the chloroform proved to be an organic base, for which I propose the name "ulexine."

To prepare a larger quantity of the base I operated upon 3 kilos of furze seed crushed to fine powder, moistened with 84 per cent. alcohol, closely packed in a percolator and slowly exhausted with a further quantity of alcohol. The percolate on distillation gave a residue of oily-looking green extract, having the appearance of extract of male fern, and like it giving a deposit; the yield was 270 grams. This extract was repeatedly shaken with hot water until the oily matter seemed exhausted of alkaloid; the insoluble portion was set aside for future examination. The watery solution, carefully evaporated to 250 cc. and allowed to cool, was then mixed with excess of ammonia, and shaken with several portions of chloroform; the chloroform solutions left on distillation a brown syrupy residue containing the base. For the purpose of purification, it was made neutral with hydrochloric acid; the product almost immediately solidified to a mass of crystals, which were washed with absolute alcohol to remove coloring matter. A further treatment with ammonia and chloroform gave the pure base as a compact crystalline mass weighing 4.3 grams, being a yield of .143 per cent. calculated on the seed. Since the above experiment was made, I have found that much alkaloid was left in the residue, and its complete removal will form the subject of another communication.

Ulexine forms colorless, odorless crystals, with a bitter and somewhat pungent taste; it is freely soluble in water, forming a strongly alkaline solution. Heated, it fuses, darkens and decomposes, giving off vapor that burns with a yellow smoky flame, and leaves no residue. Small portions placed on watch glasses gave, with nitric, hydrochloric, hydrobromic, sulphuric and oxalic acids, in a few hours, well crystallized salts. The salts appear to be freely soluble in water,

very strong solutions of them giving precipitates with caustic potash and soda soluble in excess, but they give no precipitate with ammonia.

Ten per cent. solutions of the carbonates of potassium, sodium and ammonium, or of the iodide, chromate and ferrocyanide of potassium give no precipitates; permanganate of potassium is almost immediately reduced by it. Picric acid gives a yellow precipitate; chromic acid no precipitate. Brought in contact with strong nitric, sulphuric or hydrochloric acids no reaction is apparent.

The watery solution of the pure base gives a green precipitate with ferrous sulphate, a black precipitate with mercurous nitrate, and a white precipitate with mercuric chloride.

From a few experiments carried out in the physiological laboratory of University College, I am able to say that ulexine acts on frogs as a paralyzing agent, causing clonic spasms; placed on the tongue the chloride produced a slight numbness similar to, but not nearly so powerful as cocaine. Knowing that many animals feed readily on the furze plant, it may be inferred that the alkaloid is not of a powerful or poisonous nature; but this idea must not be too hastily accepted, until we obtain precise evidence as to its action, for we know that some poisonous plants are eaten by animals without ill effect. It must be remembered that my observations have been confined to the seed; it yet remains to be proved whether other parts of the plant contain the same active principle, and I am continuing my work in that direction.—*Phar. Jour. and Trans.*, Aug. 7, p. 101.

## GLEANINGS FROM FOREIGN JOURNALS.

BY GEO. H. OCHSE, PH.G.

*Assay of Cinchona Barks.*—After having tried the various processes for assaying cinchona barks since 1879, Kaspar (*Schweiz. Wochenschr. f. Phar.*, 1886, No. 24) comes to the conclusion that success depends on the alkali used to precipitate the alkaloids, the time allowed for subsiding, and the choice of the proper solvent for dissolving the precipitate.

To exhaust the bark some use acidulated water; others use acidulated alcohol; some mix the bark with ammonia or caustic soda and then extract with ether, chloroform, benzol or amylic alcohol; some mix the bark with lime or magnesia and water and evaporate to dryness on a water-bath, then exhausting with the above mentioned solvents. The



following table shows the quantities of different menstrua required to exhaust 10 grams of an 8·8 per cent. succirubra bark :

Water,.....	1100·00 grams.
“ with 1·50 sulphuric acid,.....	650. grams.
“ “ “ “ “ and 2·0 glycerin, .....	350. grams.
Diluted alcohol.....	150. grams.
Stronger “ .....	90. grams.

In order to hasten exhaustion the bark was mixed with 50 grams of acidulated water and heated by means of a water-bath but the solutions were turbid, then muriatic acid and alcohol were used with much better results. Hydrochloric acid is preferable to sulphuric acid, because an excess can readily be evaporated. Kaspar's method is as follows: Into a flask holding about 150 cc. and connected with a condensing tube are placed 50 cc. of 90 per cent. alcohol, 20 drops of dilute hydrochloric acid and 10 grams of finely powdered bark, the whole heated in a water-bath for 10 minutes, then expressed, the operation repeated with 50 cc. of alcohol and 10 drops of dilute hydrochloric acid, expressed, and treated for the third time with 50 cc. alcohol and expressed—the liquids are mixed, filtered and evaporated—stirring constantly—to 10 grams. To assay the alkaloid Hager uses picric acid; Schmid and Wolfrum mix with marble and evaporate, then exhaust with absolute alcohol; Prollius advises mixing ether, alcohol and ammonia with the powder; Löscher precipitates with a saturated solution of alum and subsequent supersaturation with ammonia, the precipitate is dried and treated with amylic alcohol or chloroform. Mayer uses potassio-mercuric iodide; Flückiger moistens the bark with ammonia, and after the lapse of one hour mixes with milk of lime, when dry it is treated with ether, chloroform or alcohol; Rabourdin precipitates the infusion with caustic potash and extracts with chloroform; Coëytaux extracts with a mixture of 1 volume of amylic alcohol and 3 volumes of benzol. Hager's method yields small quantities due very likely to the solubility of the picrates. By treating calisaya bark according to Schmid-Wolfrum's method 3·575 per cent. of a brown, amorphous mass was obtained, after purification the yield was only 1·96 per cent. Prollius' method appears to be a practical one, but requires too much material to exhaust the bark thoroughly.

Comparative tests made according to these methods gave the following percentages: Hager, 1·65 per cent.; Schmid-Wolfrum, impure,

3.575 per cent., pure, 1.96 per cent. ; Prollius, one extraction, 1.680 per cent., two extractions, 1.950 per cent, three extractions, 2.030 per cent.

Lösch and Flückiger's methods and all those requiring much heat yield small percentages. Coëytaux's method also yields a small percentage. Mayer's and Rabourdin's methods give the most satisfactory results. In Rabourdin's, however, a 10 per cent. caustic soda was substituted for the caustic potash and repeated extraction with chloroform. From 10 grams of succirubra bark, treated as before mentioned with hydrochloric acid and alcohol, the yield according to the different methods was as follows :

Coëytaux .....	0.515 grams.
Lösch.....	0.565 grams.
Flückiger .....	0.613 grams.
Rabourdin .....	0.840 grams.
Mayer .....	0.882 grams.

Kaspar's modification of Rabourdin's process is as follows: 15 grams, 10 per cent. solution caustic soda, 10 grams of the fluid extract and 15 cc. of ether are mixed in a tube 30 cm. long and 2 cm. wide. The mixture is shaken frequently and allowed to stand one day, the ethereal layer is removed with a pipette and the operation repeated twice more, using in each instance 15 cc. of ether. The ethereal solutions when mixed, filtered and evaporated yield besides traces of other bases, the crystalline and amorphous quinine. The alkaloids, which are insoluble in ether, are extracted in the same way as the quinine, using 15 cc. of chloroform in each operation. The filtered chloroformic solutions are evaporated and the residue figured as quinidine, cinchonine and cinchonidine.

*Syrupus Althææ*.—A stable syrup of althea can be prepared by filtering the infusion on the sugar, then boiling. Marshmallow syrup, when thus prepared, is of a very light color and keeps even during the summer months.—*Pharm. Zeitung*, 1886, p. 449.

*Austrium, a new element*.—Edward Linnemann, professor of chemistry at the University of Prague, found in *orthite*, of Arendal, a mineral rich in rare metals, a new element, to which he gave the name of *austrium*, symbol *Aus*. The solutions of *orthite* must first be freed from the rare metals by ordinary methods, and the iron nearly all precipitated as oxalate, then treated with hydrogen sulphide which precipitates most of the lead, copper, tin and arsenic.

After filtering, the solution is exactly neutralized and an alkali acetate is added, when treated with sulphuretted hydrogen or sulphhydrate of ammonium it still yields a precipitate, and on exposure to the air, austrium with other metals is precipitated. The spectrum of austrium is characterized by two violet lines, the more intense one being near D which is the principal one for potassium, the other is a little further distant. Austrium is separated from zinc with great difficulty. Jungfleisch and Lecoq de Boisbaudran believe it to be identical with gallium. Certain reactions of oxide of austrium, for instance, its solubility in caustic alkalies and its adherence to zinc sulphide when precipitated, are identical with gallium.—*Jour. de Phar. et de Chimie*, xiv, p. 41.

*Butter tests.*—Liebschütz saponifies the butter with barium hydrate and extracts the glycerin with stronger alcohol, filtering and then evaporating at 100° C. Pure butter yields 3.75 per cent. glycerin, artificial butter, 7 per cent.—*Phar. Zeitschr. f. Russland*, xxv, p. 397.

*Iodol Gauze* is prepared by saturating gauze in the following solution: R. iodol 1, resin 1, glycerin 1, alcohol 10.—*Schweiz. Wochenschrift*, xxiv, p. 275.

*Hydrochloric Acid free from Arsenic* is obtained by macerating copper shavings in the acid for 36 hours, decanting and redistilling. According to Hager, chloride of iron and chloride of tin do not yield satisfactory results, as more or less of these salts is found in the distillate.

*Preservation of Salicylate of Sodium.*—If crystallized or powdered salicylate of sodium is placed in a glass vessel and exposed to the light for about 4 or 6 weeks it darkens, loses its acid reaction and forms dark solutions, whilst the same, protected from light, remains colorless and preserves its reaction. Salicylate of sodium is also affected by moisture; when kept in perfectly dry bottles and sheltered from light no change is produced, but when kept in paper it soon becomes gray and inert. Solutions of salicylate of sodium made with spring-water soon darken, but when made with distilled water no change occurs.—*Nouveaux Remèdes*, ii, 379.

*Naphthalin Leaves for exterminating Moths* are prepared by melting together carbolic acid and ceresin each 1 part, naphthalin 2 parts, and painting on sheets of unglazed paper.—*Phar. Rundschau, Prag*, xii, p. 594.

*Characteristic Reaction between Apomorphine and Cocaine.*—When

a dilute solution of apomorphine is added to a dilute solution of cocaine hydrochlorate a green coloration is produced. The reaction takes place in several minutes and being very delicate can be used as a reagent.—*Phar. Rundschau, Prag*, xii, p. 614.

*Knodalin*.—A mixture highly recommended for the destruction of all kinds of vermin on plants consists, according to Barenthin, of 2 to 3 grams nitrobenzol, 10 grams xanthogenate of potassium, 400 grams potash soap, containing about 60 per cent. of water, and 600 grams amylic alcohol. Knodalin is a reddish-brown, oily liquid, having an alkaline reaction and a strong odor of amylic alcohol.—*Archiv der Pharm.* 1886, xiii, p. 673.

*Characteristic Reaction for Codeine*.—By rubbing a small quantity of codeine with two drops of a solution of hypochlorite of sodium on a watch crystal and adding four drops of concentrated sulphuric acid a beautiful sky-blue color is produced. This reaction is characteristic for codeine, as no other alkaloid is known to produce the same reaction.—*Phar. Centralhalle*, xxvii, p. 321.

*Potassium ferrate*.—C. L. Bloxam states that ferrate of potassium can be made in a short space of time by dissolving a piece of caustic potash in a small quantity of solution of chloride of iron, adding several drops of bromine and warming slightly. The resulting dark brown mass is soluble in water, forming an intense red solution. Barium chloride yields a heavy purple-red precipitate of barium ferrate, the solution becoming colorless. A beautiful red solution of ferrate of calcium is obtained by treating chlorinated lime with ferric chloride and boiling with water; filtering through paper destroys the color. The rose-red color frequently noticed when boiling solutions of chlorinated lime is due to the formation of ferric chloride.—*Chemiker Zeitung*, x, p. 178.

*Dr. Magitot's Toothache Drops* consist of chloroform, tincture of opium and creasote of each 2 grams, tincture of benzoin 6 grams.—*Les Nouveaux Remèdes*, ii, p. 338.

*A new and characteristic reaction for Gold*.—To several drops of a dilute solution of chloride of gold is added several drops of a solution of arsenic acid, 2 or 3 drops of solution of ferric chloride and 2 or 3 drops of hydrochloric acid, the whole diluted with 100 cc. of water. When a piece of zinc is thrown in the mixture the liquid immediately around the zinc assumes a purple color, and when agitated the color is distributed to all the liquid, and remains for half

an hour. This reaction is very delicate even in solution of 1:1000,000. The color disappears at once when the mixture is shaken with zinc dust. If no hydrochloric acid is added a purple precipitate consisting of double arseniate of iron and gold is produced. If phosphoric acid is used in place of arsenic acid a violet or blue coloration results.—*Phar. Centralhalle*, xxvii, p. 321.

### THE ANALGETIC ACTION OF CARBOLIC ACID AND THE CRESOL GROUP OF COMPOUNDS.

BY DR. R. McNEILL.

Dr. McNeill has made some experiments on himself and others with carbolic acid and the cresols to determine whether their local anæsthetic influence can be utilized. He finds that a mixture of sixty parts of acid and forty of oil renders the skin of the arm insensitive to pain caused by superficial incisions. It produces, however, a sensation of heat, but this can be removed without any interference with the anæsthesia by the application of glycerin.

A mixture of glycerin and acid will have the same effect as the oil and acid, but only if twenty per cent. stronger. Impure carbolic acid having appeared more effective as a local anæsthetic than the absolute phenol, Dr. McNeill tried the effect of several of the substances allied to carbolic acid which are produced in the distillation of coal. Several of these, as benzol and toluol, had no effect. A mixture of ortho- and para-cresol (sold as cresolene) was found to have a similar effect to carbolic acid, but was not so powerful. Paracresol, on the other hand, acted more powerfully, equal parts of this substance and oil producing anæsthesia.

It is worthy of note that whilst analgesia is produced the sensation of touch remains, and that the deeper parts may be opened painlessly by introducing some of the anæsthetic compound into the tissue laid open.

Dr. McNeill records some cases in which he performed minor operations without pain by the aid of carbolic acid or cresol. No sloughing or other trouble followed their use.

As a mixture of glycerin and carbolic acid is a less powerful corrosive than a mixture of oil and acid, Dr. McNeill suggests that glycerin should be administered in poisoning by carbolic acid instead of oil.—*Med. Chronicle*, July, 1886; *Edinb. Med. Jour.*, June.



## PTOMAÏNES AND LEUCOMAÏNES.

BY A. GAUTIER.

The author gives a *résumé* of the work done on these alkaloids. From the muscle of large animals, he has succeeded in obtaining five new alkaloids, (leucomaïnes), perfectly definite in composition and crystalline form, which, when administered to animals, act more or less powerfully on the nerve centres, inducing sleep, and in some cases causing vomiting and purging, in a manner similar to the alkaloids of snake poison, but less powerfully than the ptomaïnes. These bases are formed during life and occur in the urine, saliva, venom, and various glandular secretions; but the author has more particularly studied their occurrence in muscle.

*Xanthocreatinine*,  $C_8H_{10}N_4O$ , is the most abundant of the bases obtained from muscle. It consists of light sulphur-yellow spangles, with a slightly bitter taste. The crystals are very soluble in water and soluble in hot alcohol. They slowly blue reddened litmus paper and redden the blue paper. The hydrochloride is obtainable. The platinochloride is very soluble, and crystallizes in long sheaves. The aurochloride is difficult to obtain in the crystalline form. The substance closely resembles creatinine. This resemblance, together with its yellow color, is indicated in its name.

*Grusocreatinine*,  $C_8H_8N_4O$ , is decidedly alkaline to test-paper, and gives a soluble non-deliquescent hydrochloride, and a soluble platinochloride. The slightly soluble aurochloride occurs in crystalline grains. This base neither precipitates zinc from its acetate nor mercury from its nitrate, but it precipitates alumina from alum solutions. It strongly resembles creatinine.

*Amphicreatinine*,  $C_8H_{10}N_7O_2$ , occurs in small quantity only. It is a feeble base, forming a non-deliquescent crystalline hydrochloride. Its platinochloride is soluble in water, insoluble in alcohol, and forms lozenge-shaped plates. Its aurochloride forms very soluble, microscopic, hexahedral and tetrahedral crystals.

*Pseudoxanthine*,  $C_4H_8N_2O$ .—The alcoholic mother-liquors from the preceding compounds are freed from alcohol, the residue is taken up with water, and treated with copper acetate in slight excess. On heating, a precipitate is obtained from which the copper is separated by means of hydrogen sulphide. On filtering the boiling solution, a light sulphur-yellow powder is obtained. This substance readily

forms a very soluble hydrochloride. It is similar to xanthine, except that it is slightly more soluble, and there is a little difference in the crystalline form. The author has also obtained two other bases of the composition  $C_{11}H_{24}N_{10}O_5$  and  $C_{12}H_{25}N_{11}O_5$  respectively, whose reactions show their close relation to creatinine. During the writing of this paper, Brieger has described a very poisonous leucomaine, of the composition  $C_8H_{15}NO_2$ , obtained from poisonous mussel, which he calls *mytilotoxine*.—*Jour. Chem. Soc., July, 1886, p. 634. J. Pharm. [5], xiii, 354–360, and 401–409.*

### WOOD NAPHTHA.

By C. A. FAWSITT.

After referring to the composition of wood, the author discusses the conditions on which the yield of the different products of wood distillation depends. The species, age, and condition of the wood, as well as the soil it is grown in, affect the yield of the different products. Hard woods are preferred by the wood distiller, oak, beech, and birch being mostly used. The following particulars show the difference in yield of acid for 100 parts of oak and Scotch fir:—

	Crude acid.	Acetic acid.	Tar.	Charcoal.
Oak.....	47.6	5.4	6.4	24.9
Scotch fir.....	45.0	2.7	10.0	28.0

The yield of products is influenced also by the temperature, size, and shape of the retorts. As a rule, a low heat gives more charcoal, acid, naphtha, and tar, but less permanent gas than a high temperature. The aim of the distiller being to obtain the largest possible yield of acid, the heat of the retort is regulated accordingly. It has been found that the most suitable temperature is 350–400°.

In the second part of the paper, the author refers to the preparation, properties, and uses of wood-naphtha. The crude naphtha has a sp. gr. varying from 0.970 to 0.990. It has a dark brown color and strong odor. Besides water, it contains methyl alcohol, acetone, methyl acetate, aldehyde, allyl alcohol, dimethyl ethylidene ether, also small quantities of mono-, di-, and tri-methylamine, ammonium acetate, oils, and tarry matter. As to methods in use for working up the crude naphtha, that involving distillation by means of lime gives the best product. The lime retains the water and acid, almost entirely decom-

poses the methyl acetate and simple and compound ammonias, converts the greater part of the oils into solid resinous bodies of high boiling points, and diminishes the percentage of acetone, which, on treatment with lime, gives condensation-products of high boiling point. In conclusion, the author refers to the composition of the oils present in the crude naphtha.—*J. Chem. Soc.*, 1886, p. 289; *J. Soc. Chem. Ind.*, iv. 319.

## NEW CONSTITUENTS OF *ATROPA BELLADONNA*.

By H. KUNZ.

The occurrence of a fluorescent compound in belladonna has been repeatedly noticed. The author has found this compound both in the extract of the root and of the leaves and stalk; the root extract was acidified until all fluorescence disappeared, and then agitated with ether. The brownish-yellow residue left on evaporation of the ethereal solution consisted of microscopic prisms having an acid reaction. By washing with cold ether, a non-crystallizable, bitter mother-liquor was separated, which was reserved for further examination. The crystals were purified by repeated treatment with boiling absolute alcohol, which finally yielded small clusters of light yellow, four-sided, highly refractive, rhombic prisms. This substance the author names provisionally *chrysotropic acid*,  $C_{12}H_{10}O_5$ . It melts at  $201.5^\circ$ , resolidifies at  $182.6^\circ$ . When carefully heated, the acid sublimes without decomposition, but when more strongly heated burns with a luminous flame leaving no residue. It is soluble in 70—80 parts of hot water, sparingly in cold water and in ether, more soluble in alcohol and acetic acid. The concentrated aqueous and alcoholic solutions are pale yellow by transmitted light, but by reflected light show a beautiful emerald-green fluorescence; dilute solutions give a blueish fluorescence. The crystals dissolve in alkalis or alkaline carbonate solutions, yielding splendid blueish-green fluorescent solutions. An aqueous solution when treated with potassium permanganate gives a green liquid showing strong indigo-blue fluorescence. Ferric chloride gives an emerald-green coloration changing to cobalt-blue. The lead and copper salts were examined and described. From the formula and reactions of the substance, the author infers a near relationship to hydroxynaphthaquinone.

*Leucotropic acid*,  $C_{17}H_{22}O_5$ , is obtained from the bitter mother-liq-

nor previously mentioned; it crystallizes in clusters of microscopic prisms having a satin-like lustre, it melts at  $73.8^{\circ}$ , and resolidifies at  $60.2^{\circ}$ . It is insoluble in cold, but somewhat soluble in boiling water, it is nearly insoluble in cold, but readily soluble in boiling ether and in alcohol. Qualitative examination indicates that the compound belongs to the fatty acid series.

The author also found about 0.6 per cent. of succinic acid in belladonna extract prepared from the herbaceous part of the plant.—*Jour. Chem. Soc.*, 1886, p. 255. *Archiv d. Phar.* [3] xxiii.

## FORMATION OF OXALIC ACID IN VEGETATION.

BY BERTHELOT AND ANDRÉ.

The plants selected and examined at various stages of their growth were *Rumex Acetosa*, *Amarantus caudatus*, *Chenopodium Quinoa*, and *Mesembrianthemum crystallinum*. The juice of the first is always acid, that of the second and third neutral or feebly acid, whilst that of the last is neutral in the early stages of growth, but becomes acid as the plant develops. The plants also differ very considerably in the ratio between the soluble and insoluble oxalates which they contain.

*Rumex Acetosa*.—The seed or dried fruit contains 0.05 per cent. of oxalic acid. In the early stage of growth (June 8th) the root contains 13.9 per cent. of oxalic acid, 5.1 per cent. being soluble and the remainder insoluble. The proportion of ash is 20.7 per cent., and some of the acid is in the free state. When the plant is in active vegetation (June 26th), the absolute quantity of oxalic acid has increased, but the relative proportion has diminished owing to the development of ligneous tissue and albuminoids. The total proportion is about 10 per cent., and it is especially abundant in the leaves and limbs, and least abundant in the root, in which it is almost entirely insoluble owing to the proximity of the calcium compounds in the soil. In the limbs, about one-half is in the insoluble condition. The actual acidity is below the total oxalic acid in the limbs, but is higher in the roots and petioles, and hence the latter contain some acid other than oxalic acid. The limbs contain soluble oxalate and soluble calcium salts in almost equivalent quantities, but these must either circulate in different vessels or exist in the form of ethereal



salts or double salts. The existence of soluble oxalates and calcium salts in the same parts of a plant may in fact be explained in three ways. The oxalates may exist in the form of double salts of potassium, calcium, and magnesium, dissociable by water, or the formation of oxalic acid may take place in special vessels, or the oxalic acid may exist in the form of ethereal salts which are ultimately decomposed in contact with calcium compounds.

When the plant begins to fructify (September 27th), the absolute amount of oxalic acid has increased, but in much lower proportion than the increase of the whole plant, so that the percentage amount is only one-fourth of what it was at the early stage of growth. The decrease is most considerable in the roots and limbs. In the former, almost all the oxalic acid is in the insoluble form, whilst in the limbs and petioles the soluble oxalates preponderate. At the same time there is a diminution in the proportion of ash. The calcium is in excess of the oxalic acid in the root, but in the petioles and stalks the reverse is the case. The limbs are rich in soluble oxalates and also in calcium salts.

The leaves of *R. Acetosa* are very rich in nitrogenous substances. They are also the principal seat of the formation of oxalic acid, whereas nitrates undergo destruction in the leaves (*Ann. Chem. Phys.* [6], viii, 41). It would seem therefore that the oxalic acid is a product of the incomplete reduction of carbonic acid. If, however, the ratio of oxygen expired to carbonic anhydride absorbed remains constant, the production of oxalic acid in this way would require the simultaneous production of some highly hydrogenized compound as a compensating reaction. Such hydrogenized compounds are found in the albuminoids which are so abundant in the leaves.

*Amarantus caudatus*.—This plant contains a considerable proportion of nitrates (*loc. cit.*) and the oxalic acid is mainly in an insoluble form. At the commencement of inflorescence (June 18th) the percentage of oxalic acid was 5.86 or about half that found in *R. Acetosa*. The nitrates are found chiefly in the stalks whilst the oxalates are most abundant in the leaves and flowers. As inflorescence progresses (July 26th), the amount of oxalic acid increases in proportion to the growth of the plant but remains almost entirely in the insoluble form. When inflorescence was fully developed (September 17th), the total weight of the plant had increased six-fold, whilst the amount of oxalic acid remained the same, still in the insoluble form and existing



in greatest abundance in the leaves. It would seem therefore that the formation of oxalic acid takes place principally during the earlier stages of the plant's growth, and ceases during the period of inflorescence.

*Chenopodium Quinoa* yields a neutral juice which is almost free from nitrates, but contains a relatively large proportion of soluble oxalates. In the early stage of growth (May 18th), the percentage of oxalic acid was 3.9, and the bases in the ash (25.6 per cent.) were far more than sufficient to neutralize the whole of the acid. When the plant was in full vegetation but had not begun to flower (June 12th), the oxalic acid had increased in proportion to the growth of the plant, but was very unequally distributed, about one half being in the soluble form. The absolute amount was greatest in the leaves, next in the stalk, and somewhat less in the roots and flowers, but the relative proportions do not differ much in different parts of the plant. When the plant was in flower (July 17th), there was a considerable absolute, and a considerable though smaller proportional, increase in the amount of oxalic acid, which was still at a maximum in the leaves, and was also abundant in the flowers. The proportion of soluble oxalates becomes greater and greater in passing from the stalks to the leaves, and from the leaves to the flowers. All the parts contain no deficiency of calcium, but the insoluble oxalates predominate in the stalks. At an advanced stage of fructification (September 14th), both the absolute and relative quantities of oxalic acid had diminished, the absolute quantity being greatest in the flowers, whereas the relative proportion was greatest in the leaves. The relative proportion of insoluble oxalates had generally increased, but in the roots the proportion of soluble oxalates had become somewhat high, a fact which indicates that towards the end of vegetation the root absorbs little or nothing from the soil.

*Mesembrianthemum crystallinum*.—The seed does not contain oxalic acid. In the early stage of growth (June 9th), a considerable quantity of oxalic acid is formed, a part being in the soluble form. Alkaline salts are abundant and the juice is neutral. As growth proceeds (July 8th), the juice becomes acid and the soluble oxalates predominate, the greatest proportion being found in the leaves. At a later stage, when flowers begin to open (September 25th), the juice is neutral in the root, but is acid in the stalks and especially in the leaves.—*Jour. Chem. Soc.*, 1886, p. 734; *Compt. rend.*, cii.

## AMERICAN PHARMACEUTICAL ASSOCIATION.

This Association not having met in the New England States since 1875, it was to be expected that the thirty-fourth annual meeting which convened in Providence, R. I., on the afternoon of September 7th, should be attended by a large number of members residing in that section of the country. This expectation was verified; and since Providence is very accessible, and is located in close proximity to numerous places of resort on the seashore, on islands and among the mountains, an opportunity for a few days rest and recuperation was afforded to, and enjoyed by, many after the sessions had finally closed. The weather had become unexpectedly warm; but during the night was moderated by refreshing breezes from the beautiful Narragansett Bay. Though the location of Blackstone Hall, where the sessions were held, was not near as quiet and free from noise as had been supposed, and within the hall the sultriness of the atmosphere was but little mitigated, the attendance at the sessions and the interest manifested in the proceedings were quite satisfactory. The number of members and delegates registered was 175; but considering those who had omitted to place their names on the register, the attendance was, probably, fully 200.

The sessions were opened on Tuesday afternoon with the reading of the annual address by President Roberts. After a few introductory remarks the speaker referred to the present unremunerative condition of pharmacy as a business, and to one of the most prominent causes, namely, to the large and increasing demand for proprietary medicines which filches from the pharmacist so large a portion of his legitimate profits. The so-called "elegant" pharmaceuticals are included under the same head, but the president very properly regards these latter as having attained such importance that they must not be ignored. As a remedy the amplification of a resolution passed by the Maryland State Pharmaceutical Association in 1885 was recommended, urging its members "to use their best efforts to induce physicians, when prescribing, to give preference to officinal remedies."

By way of a retrospect we may be permitted to refer to the action of the American Pharmaceutical Association at the close of the first year of its existence (1853), when the elixir-nuisance and the semi-proprietary pharmaceuticals of the present day were unknown. This action was in opposition to the increasing nostrums; and without quoting the whole, it will be sufficient to state that it was declared to be "the duty as well as interest of the apothecaries and druggists to advocate the use of the officinal medicines in lieu of the quackery of the day; that this can only be done by a united and sustained action on the part of the pharmacists and druggists of the Union, and that this course should receive the sanction of the physicians as the only one likely to remedy the evil aimed at."

It will be seen that these expressions, made one-third of a century apart, are alike in spirit; but President Roberts proposed also the practical action to communicate officially with the various medical associations on this subject.

In next speaking of the diminished numerical growth of the Associa-

tion within the past few years, the business depression was not directly alluded to as one of the causes; but the preponderance given to what is termed scientific pharmacy was prominently put forth, and it was suggested, that the material and scientific interests should both receive due attention, and that the social features should not be permitted to interfere with business. The question of a reserve fund was fully discussed in the light of the report of the Committee on Finance printed in the last Proceedings, Mr. Roberts placing himself in opposition to the accumulation of such a fund, and recommending the abolition of the admission fee, and the discontinuance of an entertainment committee by the Association.

In the multiplication of State and local pharmaceutical associations President Roberts sees a new and important factor of progressive pharmacy, and suggested as one of the methods for cultivating intimate relations and cordial feelings, that suitable questions bearing on the practice of pharmacy, be referred to the State Associations for consideration and report to the National Association, and that the State Associations be invited to communicate freely with this Association upon all questions of pharmaceutical interest that may be deemed of national importance.

Mr. Roberts further advised that every facility be accorded to all pharmaceutical journals for making a full and accurate report of all transactions; that a standing committee on revision of the pharmacopœia be created; that a committee on materia medica or pharmacognosy be appointed as had previously been proposed by Mr. Ebert; and that members of Council should not be eligible for re-election within one year of the expiration of their terms of office. The concluding remarks of the presidential address were devoted to the necessity of exacting greater proficiency from the students proportionate to increased opportunities for acquiring knowledge; and words of caution were offered against an indiscriminate multiplication of colleges of pharmacy without actual need.

The address was attentively listened to and was referred to a committee for consideration and report.

The list of delegates showed that delegations had been appointed from 12 colleges of pharmacy, from 25 State Pharmaceutical Associations, from 7 local societies, and from 7 Alumni Associations. The National Wholesale Druggists' Association was likewise represented by a delegation. A telegram was received from ex-President G. J. Luhn, of Charleston, S. C., regretting his forced absence on account of the destruction of property by the recent earthquake.

The nominating committee was appointed, consisting of one delegate from each college of pharmacy and State Association, and of the following non-delegates: Prof. Remington, E. Bocking, R. H. Vansant, H. S. Wellcome and L. Eliel.

The various committee reports were read by title, and afterward that on membership in full. During the year the number of members decreased from 1359 to 1294, the deaths reported being 20.

The Minutes of Council during the past year were read and approved, and 19 applications for membership were reported.

Notice was given of an amendment to the By-Laws favoring the abolishment of the Committee on Drug Market; but no action was taken on this proposition during the meeting.

An invitation was extended to the physicians and druggists present in the city to attend the sessions and participate in the discussions.. The first session closed with the reading of the treasurer's report in which that officer declined a re-election as treasurer.

*Second Session.*—On Wednesday morning after reading the minutes of the first session and of the Council, the report of the nominating committee was received and adopted by the election of the nominees. The officers for the ensuing year are:

President—Charles A. Tufts, Dover, N. H.

Vice Presidents—Henry J. Menninger, Brooklyn, N. Y.; M. W. Alexander, St. Louis, Mo.; N. A. Kuhn, Omaha, Neb.

Treasurer—S. A. D. Sheppard, Boston, Mass.

Secretary—John M. Maisch, Pennsylvania.

Reporter on Progress of Pharmacy—C. Lewis Diehl, Louisville, Ky.

Members of Council—George W. Kennedy, Pottsville, Pa.; A. H. Hollister, Madison, Wis.; William H. Rogers, Middletown, N. Y.; P. C. Candidus, Mobile, Ala.

The chairmen of the standing committees were as follows: Drug market, G. J. Seabury, New York; papers and queries, Virgil Coblentz, Springfield, O.; prize essays, C. L. Diehl, Louisville; legislation, T. L. A. Grieve. At a later period Mr. Seabury declined serving on the committee on the drug market, and Mr. A. H. Mason, Montreal, was elected in his place. Mr. Grieve resigned from the committee on Legislation, stating that Mr. Chas. W. Day, Springfield, Ill., had really received the nomination, and the name of this member was accordingly ordered to be put in the place of Mr. Grieve's.

A telegram from San Francisco, inviting the Association to meet in that city, was read and referred to the committee on the time and place of the next annual meeting, consisting of Messrs. J. D. Wells, Emlen Painter and P. W. Bedford.

Mr. Sheppard proposed an amendment to the by-laws, reducing the treasurer's salary from \$750 to \$600, which was adopted at the fourth session.

Three candidates were proposed for membership, after which the reports of the committees were read. The first one read was on *Legislation*, reporting new pharmacy laws having been passed during the year in the State of Virginia and the territory of Wyoming, and amended laws for Kings county and Erie county, N. Y., and for the States of Iowa and New Jersey; also laws requiring the use of red labels for morphine in the States of Florida, Georgia, Kentucky, New York, Ohio and Virginia, and amendments to the adulteration of food and drug law of the State of New York. The report also presented the following preamble and resolution with the view of communicating to the proper authorities the action of the Association in regard to legislation on proprietary medicines:

*Whereas*, All medicines concern the health of those who use them; and



*Whereas*, The purchaser of a medicine selected by himself, has the right to receive information of its constituents and their qualities; and

*Whereas*, The report and the draft of a law regulating the sale of proprietary medicines, which were accepted by the American Pharmaceutical Association at its meeting held in September, 1885, embrace a method whereby the above mentioned objects may be secured; therefore, be it

*Resolved*, That the President and other officers of the Association be authorized and instructed to present printed copies of the reports and of the action had in this Association upon said reports, to the Governors, to the Speakers of the Senates and Houses of Representatives, and to the State Boards of Health of the different States of the United States; also to offer any services wherein these authorities may consider the co-operation of this Association desirable or useful.

A motion by Mr. Macmahan to strike out the resolution was defeated by a vote 20 ayes and 47 nays; and after a motion by Mr. E. A. Sayre, to lay it on the table was lost, the resolution was adopted.

A report by Mr. Sloan, on the best time for holding the annual meeting was presented. Of a total of 781 members, 345 had designated the month of September, 145 August, and 118 October, as the most suitable month, the other 173 votes being divided among the remaining nine months. The correspondence had also elicited the information that many pharmacists could not afford the expense of time and money necessary in attending, and that a number of valued members were not in sympathy with the entertainment methods; it was therefore suggested to drop entirely the subject of entertainments.

Mr. Kline read the report on the drug market, prepared by him, in place of the chairman who had been prevented. The report gives the average prices of the more important drugs, and discusses the causes that lead to an increase or decline.

Mr. Lemberger read the report of the committee that had attended the meeting of the National Wholesale Druggists' Association; the committee from the latter was formally received, and another committee was appointed to attend the next meeting in St. Paul.

Further reports were read on publication, on prize essays, and on the national unofficial formulary; the latter report made a number of suggestions, having in view the publication of a preliminary draft of such a formulary, and its perfection before final adoption.

The report of the Committee on the president's address was ordered to be printed and made the special order for 10 o'clock on Thursday morning; and the Committee on the next annual meeting was requested to report immediately afterward.

The third and subsequently also the fifth session were set apart exclusively for the reading of papers.

*Fourth Session.*—A motion was made by Mr. Redsecker, that in addition to the five members who constituted the Committee on unofficial formulas during the past year, there shall also be appointed one member of each State Association, all of whom to constitute the Committee for the present year, and that five members shall constitute a quorum for the transaction of business. This was adopted.



The report on the President's address having been printed and distributed among the members, the resolutions appended thereto—except the last one—were adopted as follows:

*Resolved*, That this Association solicit the aid and co-operation of the American Medical Association, in promoting the describing by physicians of official medicines only, or such preparations as have published formulas, in preference to others; and that the several State Pharmaceutical Associations make similar requests of their respective State Associations.

*Resolved*, That a committee of five be appointed whose duty it shall be to inquire if there be a better plan for the management of this Association than the existing one; said committee to be appointed by the chair, and to represent the various sections of the country.

*Resolved*, That the committee on publication are hereby instructed to have the annual proceedings published and ready for delivery on or before January 1st; and they are also instructed to omit from said publication any papers that may not be in their possession in proper time for the execution of this resolution.

*Resolved*, That the multiplication of colleges of pharmacy should be discouraged except where the need of them is undoubted.

A standing committee on the Revision of the U. S. Pharmacopoeia, consisting of five members, was created but not elected.

The last resolution contemplating the discontinuance of the admission fee excited considerable discussion, and an amendment offered by Mr. Ebert to reduce it to \$2 was finally carried by a vote of 61 ayes to 39 naves; and chapter viii., art. iii. of the by-laws was then altered, 94 voting in favor and 6 in opposition.

The Committee on the next annual meeting presented a majority report in favor of Cincinnati, and a minority report in favor of San Francisco. The adoption of the minority report was lost by a vote of 26 ayes to 59 naves; and amendments to the majority report to meet in Put-in-Bay and in Detroit being likewise negatived, the report was then adopted, and on motion of Mr. Macmahan, the time was fixed for the first Monday of September, at 2 o'clock p. m. Messrs. Remington, Thompson, Alexander, Macmahan and Sheppard, were appointed the committee on the order of business.

*Sixth Session.*—In order to finish the business, each speaker was limited to three minutes.

Mr. G. W. Voss of Cincinnati, was elected local secretary and chairman of arrangement committee.

The Committee on the order of business reported progress and were granted time until next year to bring a full report.

A committee appointed for the purpose reported a resolution of sympathy with the Charleston sufferers, which was adopted and ordered to be communicated to ex-President Luhn.

The amendment to the by-laws offered by Mr. Day, to abolish the admission fee was, on motion of Mr. Macmahan, laid upon the table, and the amendment proposed by Mr. Colcord to reduce the dues to \$3.00 was not concurred in.

On motion of Prof. Markoe, the arrangement committee was specially requested to secure for the next meeting a hall in a quiet locality. After

passing votes of thanks and other routine business the Association then adjourned.

As stated before, the third and fifth sessions had been set apart exclusively for the reading of papers. In another place we print the following papers in full: Analysis of *Phlox carolina*, by Prof. Trimble; Assay of Guarana, by H. W. Snow, and Determination of Melting Points, by H. C. C. Maisch.

The remaining papers presented were as follows:

*A Study of Peptonization*, by R. G. Eccles, M. D.—This is a lengthy inquiry into the nature of peptones, and the conditions of digestion in the presence of various acids and other compounds, and at different temperatures. While many salts throw down a portion of the peptones, the best precipitants are the sodio-hydric and disodic molybdates, causing white precipitates which are partly soluble in ammonia with a light blue color; but in the presence of potassium citrate or acetate, which salts throw down a portion of the peptone, the molybdate fails to produce a precipitate. Many samples of pepsin yield similar precipitates with the molybdate, but it has not yet been ascertained whether pure pepsin is thus affected. True peptone is the product of true digestion, and is soluble in alkaline, acid and neutral liquids, while parapeptone, an injurious product of semi-digestion, is precipitated by salts in neutral solutions, and in some cases also from acid liquids. The best results for the peptonization of ground albumen at a temperature of 38°–40° C., were obtained with .3 and .2 per cent. of HCl in 90 minutes, and with .2 per cent. in 30 minutes, while the peptonizing power decreased if less than 1 per cent. of phosphoric, citric or tartaric acid was used. The effects of other acids differed from these. For the purpose of testing the peptonizing power, the temperature of 55° C. (130° F.), applied for 30 minutes, was found to be the best. Pills containing pepsin and reduced iron, had been found to have no digestive power, and it was ascertained to be due to the disappearance of the free acid. Alcohol scarcely interferes with artificial digestion until the strength of the mixture exceeds 8 or 10 per cent. The cinchona alkaloids have a retarding effect, but less in the presence of excess of acid. Marked retarding effects were also observed with all salicylates, bismuth citrate, alkalies, alkaline salts, oils of cinnamon and cloves, excess of glycerin, etc.

*A Study of Pepsin*, by R. G. Eccles, M. D.—In the light of the foregoing results, 22 commercial samples of American and European origin were subjected to a comparative examination, and it was found that the prices charged for the different brands were no indication of the digestive power. Selecting as the standard, a scaled pepsin, the market price of many brands were found to be of much less value than the price paid for them, while others, apparently such which are made in response to the requirements of the Pharmacopœia, were found to be worth more than they cost, the price per ounce being about 35 cents, and the value according to the standard adopted about 50 cents. However, some of the articles contain also other ferments, which may very materially raise their true value. Pepsin which becomes sticky seems to decrease in value, while dry and saccharated pepsins retain their digestive power, for several years at least.

Since there are different modifications of pepsin, some of which—*isopepsin*—produce parapeptone instead of peptone, it is important to know that the presence of a small quantity of table salt checks this production quite effectually, and interferes also to some extent with the production of true peptone.

*Paste for labeling*, by L. Eliel.—1. Tragacanth, 1 oz., gum arabic, 4 oz., water, 1 pint; dissolve, strain and add thymol, 14 grains, glycerin, 4 oz., and water to make 2 pints. Shake or stir before using it.

2. Rye flour, 4 oz., alum,  $\frac{1}{2}$  oz., water, 8 oz.; rub to a smooth paste, pour into a pint of boiling water, heat until thick, and finally add glycerin 1 oz., and oil of cloves, 30 drops.

3. Rye flour, 4 oz., water, 1 pint; mix, strain, add nitric acid, 1 drachm, heat until thickened, and finally add carbolic acid, 10 minims, oil of cloves, 10 minims, and glycerin, 1 oz.

4. Dextrin, 8 parts, water, 10 parts, acetic acid, 2 parts; mix to a smooth paste and add alcohol, 2 parts. This is suitable for bottles or wood, but not for tin, for which the first three are likewise adapted.

A paste very similar to 3, but omitting nitric acid and glycerin, is also recommended by Dr. H. T. Cummings.

*Notes to a few of the queries*, by Dr. H. T. Cummings.—The notes are on concentrated nitrous ether, ethereal oil, and oil of cajeput, with quotations from Gmelin's chemistry and other sources, and with suggestions deduced from these observations.

*Spirit of nitrous ether*, by Prof. Emlen Painter.—This is recommended to be made from pure nitrous ether, and this to be prepared by the action of nitrous acid gas upon alcohol. The gas is generated from a mixture of sulphuric acid, 2 lbs., arsenious acid, in lumps,  $2\frac{1}{2}$  lbs., and nitric acid,  $2\frac{1}{2}$  lbs., and is conducted through an empty bottle, successively through two bottles containing alcohol, and a third bottle containing water and sodium bicarbonate for the retention of any free acid, into the condensing vessel surrounded by ice where pure nitrous ether is obtained. This should then be mixed with three times its weight of alcohol, in which condition it may be preserved. One part of this mixture, with four parts of alcohol, makes spirit of nitrous ether of the pharmacopœial strength.

*Loss of alcohol in making tinctures and fluid extracts*, by J. G. Feil.—Working with from 5 to 50 pounds of drugs, the loss of alcohol averaged 9.8 per cent.; working with smaller quantities, it is estimated to exceed 25 per cent. in some cases.

*Concentrated liquid preparations for dilution*, by J. L. Lemberger.—The author considers it quite feasible to prepare concentrated liquid preparations of some drugs which may be diluted so as to bring to the pharmacopœial strength. The concentrated liquor of gentian for preparing the compound infusion of gentian is cited as an example, and from honestly prepared fluid extracts of ergot, aconite root, or nux vomica, a wine or tincture can be prepared, filling all the requirements of the corresponding pharmacopœial preparations.

*Soluble Essence of Ginger*, by Luther F. Stevens.—After a critical review of

the various methods which have been recommended, the author finds the following process yielding a liquid containing everything desired without having the flavor and aroma impaired, as is the case with the employment of heat, alkalies or carbonates: Shake 1 pint of fluid extract of Jamaica ginger with 4 ounces of powdered pumice stone, and shake with 3 pints of water, adding it slowly and allowing intervals for rest and subsidence. The water precipitates the hot resin and some coloring matter, the formation of clots being prevented by the pumice stone. The filtered product is of a light straw or amber color, of an agreeable odor and flavor and therapeutically is a prompt diffusible stimulant without irritating properties. The hot resin may be obtained from the filter by drying and washing with alcohol.

*Glyconin and its Uses*, by Geo. C. Close.—The author calls attention to this compound which was first recommended for external use by Edmond Sichel (see AMER. JOUR. PHAR., 1867, p. 181; also Proc. Am. Phar. A., 1869, p. 386), and which Mr. Close has used for emulsifying oils since 1873. The Pharmacopœia has admitted it under the title of *glyceritum vitelli*.

*Pill excipient*, by G. W. Sloan.—Simple cerate is recommended as being well adapted for readily decomposable or deliquescent substances, such as silver nitrate, silver oxide, gold chloride, potassium permanganate, ammonium chloride, zinc bromide and many others. The quantity required is small, and the mass produced is smooth, plastic, firm and readily soluble in the stomach. Powdered talc is used as a diluent if necessary, and as the powder for the pill machine.

*Abstracts*, by Virgil Coblenz.—This paper is a continuation of previous researches (see AM. JOUR. PHAR., 1885, p. 513). For assaying *abstractum ignatiæ* the alkaloids were isolated by the method of Dunstan and Short, but it was found necessary to agitate the acid solution repeatedly with ether and chloroform in order to remove all coloring matter and extractive; agitation with ammonia and absolute ether containing chloroform then yielded the alkaloids white. For the estimation of the alkaloids, strychnine and brucine, Mayer's solution gives variable results, as has been shown also by Dr. A. B. Lyons (Drug. Circ., June, 1886). Dunstan and Short's method with potassium ferrocyanide gives correct results, but requires close attention and does not permit of rapid work. Dr. Schweissinger's alkalimetric method is rapidly executed and exact. 1 cc.  $\frac{1}{10}$  N HCl neutralizes 0.00394 gm. brucine and 0.0034 gm. strychnine. The weighed mixed alkaloids are dissolved in a slight excess of measured  $\frac{1}{10}$  N HCl; the excess of acid, determined by  $\frac{1}{10}$  N alkali, is deducted; the total weight of alkaloid is divided by the number of cc. required for neutralizing it; the quotient is subtracted from 3.94; the remainder is divided by 6, when the quotient, after removing the decimal point three places to the right, indicates the weight of strychnine, that of brucine being found by difference. When the amount of alkaloid is small, weighing of the solutions gives the most accurate results; with more than 0.1 gm. measuring is practically accurate. The total alkaloids from 5 gm. of the abstract varied in five samples between .194 and .237 gm.; the strychnine between .1068 and .1813 gm.



*Abstractum Podophylli*.—Five samples were examined by treating with alcohol, concentrating and precipitating with acidulated water; the amount of resin thus obtained varied between 6.5 and 11.5 per cent., equivalent to from 3.2 to 5.9 per cent. of the drug.

*Abstractum Valerianæ*.—The amount soluble in strong alcohol from 5 gm. of five samples varied between 0.93 and 1.17 gm.

*Abstractum Senegæ*.—The abstract was exhausted with a mixture of 2 alcohol and 1 water, the liquid concentrated, freed from coloring matter by ether and precipitated by alcohol and ether. The yield of 5 gm. from six samples varied between .340 and .503 gm. Procter obtained 5½ per cent. of polygalic acid from senega root.

*Abstractum Belladonnæ*.—The alkaloid was estimated by the method of Dunstan and Ransom (AM. JOUR. PHAR., 1885, p. 582), and in five samples corresponded to from .41 and .68 per cent. of belladonna root.

*Evaporation of Percolates*, by J. U. Lloyd.—Attention is called to the results of evaporating different quantities of identical percolates under otherwise similar conditions. Small quantities of vinegar of squill, after concentration, gave a light amber-colored liquid; but on concentrating larger batches the color is finally deeper until a dark-brown red is produced. The temperature used in the experiments was between 175° and 180° F. Working in the pharmacopœial quantities yields the less altered product.

*The maintenance of standards of purity* was discussed in a paper by Prof. J. M. Good, and the relation in this respect existing between the wholesale druggist, the manufacturer and the dispenser.

*Quality of Belladonna leaves*, by Dr. A. B. Lyons.—In a large number of assays of the leaves, the author obtained once as high as 0.87 per cent. of alkaloid, and as low as 0.23 per cent.; the average was about 0.44. Twelve assays of belladonna root yielded between 0.42 and 0.86 alkaloid; average, 0.618 per cent. The average yield of extract with 66 per cent. alcohol was for the root 26.27, and for the leaves 22.5 per cent. The amount of alkaloid does not appear to decrease in pressed leaves kept for several years.

*Oleum menthæ piperitæ*, by A. M. Todd.—The paper gives a brief history of the cultivation of peppermint in England and in the United States for the production of the volatile oil, the distillation of the latter, the characters of purity and tests for the detection of some adulterations. The more important points which have not been previously noticed in this journal will be referred to in another place.

*Cannabis indica* was again examined by G. W. Kennedy for the presence of nicotine, which Preobraschensky claimed to have found in 1876. M. Kennedy demonstrated its absence in the commercial drug.

*American carbolic acid*, by Edgar M. Hatton.—The author arrives at the conclusion that carbolic acid is made in America which can well be depended on as a medicinal agent and may be used in dispensing. Low grade acids are strictly American products; and it is suggested that the sale of the true acid be encouraged.

*Hydronaphthol*, by Thos. W. McElhenie.—This substance has been noticed in this volume, pp. 93 and 158. It is recommended by the author for the



preservation of solutions for hypodermic injections, using from 5 to 7 grains to a pint of distilled water; also, for the preservation of beef juice, by sprinkling on a pound of finely chopped beef about 10 grains of the chemical, warming to 130° F. and expressing quickly. Most of the chemicals tried produce no change with the compound; nitric acid causes an orange-yellow color changing to a turbid olive-green, which, in reflected light, appears dull purple. Ammonia produces a purplish tinge, becoming straw-colored.

*Butter and its substitutes*, by Prof. E. Scheffer. The author recommends as a suitable solvent for detecting adulterations or substitutions of butter, a mixture of 40 volumes of rectified amylic alcohol and 60 volumes of ether. In applying the test, the substance and solvent are placed together in a corked test-tube at about 65° F., and slowly warmed until the temperature reaches 82° F. It was found that 1 gm. of the following fats and mixtures of fats require for solution the annexed amounts of solvent:

Butter,	3 cc.	Lard 5, butter 95 parts,	3.5 cc.
Beef suet,	50 "	" 1, " 9 "	3.9 "
Leaf-lard,	16.4 "	" 2, " 8 "	4.8 "
Neutral lard,	13.5 "		
Cottonseed oil,	1.75 "	" 3, " 7 "	5.7 "
Stearin,	550 "	" 4, " 6 "	6.5 "
Oleomargarin,	11.2 "	" 5, " 5 "	7.8 "
"	8.6 "	" 6, " 4 "	9.6 "
Oleo oil,	2.3 "	" 7, " 3 "	11.4 "
Butterin, I.,	11 "	" 8, " 2 "	13 "
" II.,	8 "	" 9, " 1 "	14.4 "

The simplicity of the manipulation, and the characteristic differences in the behavior of fats to the solvent make this well adapted not only for the determination of adulterations, but also for the approximate quantitative estimation of the adulterant. The butyric ether test will readily distinguish butterin from oleomargarin.

*Dioscorea bulbifera*, by J. U. Lloyd. A specimen of the plant with its axillary tubers was shown; it had been cultivated in Louisiana.

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**Poisoning by Vaseline.**—The reports of positive injury having been worked by the use of ointments, with vaseline as a base, upon the eye and upon the integument are not single and far between, the mischief being generally attributed to impurities of the preparation. In the *British Medical Journal*, Feb. 13, the poisoning of three children, aged from 8 to 14 years, is reported as a consequence of the internal administration of about half a teaspoonful of vaseline for sore throat. Pain and cramps in the extremities and severe vomiting ensued. No other cause than the taking of the vaseline was apparent.—*Weekly Med. Review*, May 8, 1886.

## BRITISH PHARMACEUTICAL CONFERENCE.

The 23d annual meeting was inaugurated on Monday evening, August 30th by a reception held in the Grand Hotel, Colmore Row, Birmingham, which proved to be a very pleasant and useful innovation, as it furnished an opportunity for many introductions and renewals of acquaintance at the earliest stage of the meeting. The sittings were held in the handsome Chemical Lecture Theatre of the Mason Science College, and the proceedings commenced at ten o'clock on Tuesday morning, August 31st, with a hearty greeting from Mr. Thomas Barclay, as the chairman of the local committee, which was supplemented by a graceful welcome from Professor Tilden, who expressed the pleasure with which he met so many of his old pharmaceutical friends in that theatre. The list of delegates, which was a fairly long one, having been read, Dr. Thresh, one of the honorary secretaries, read the annual report. This document commenced by referring to the steps that had been taken to carry out the announcement made at Aberdeen as to the compilation of a general index. The members were reminded that the index had been compiled and published and it was stated that the nominal price at which it has been issued will result in an encroachment on the cash balance. It next mentioned the satisfactory increase in the number of members in India and the colonies, which was attributed to the efforts of the various secretaries. The report alluded to the death since the last meeting of Mr. William Southall, who filled the office of President of the Conference in 1880. Finally, it was mentioned with regret that Mr. Sidney Plowman, who for five years has so energetically served the Conference as one of its honorary secretaries, had expressed his wish to retire from office after the present meeting. The address of the President, the delivery of which followed the adoption of the report, was somewhat ambitious in its tone, but for this it had the justification that two at least of the topics discussed are of vital interest to the future of pharmacy in Great Britain. In fact, in his choice of subjects the President seems to have been influenced by a profound dissatisfaction concerning the present condition of pharmacists in this island as well as—tell it not in Gath—considerable doubt as to whether the Conference has done, and is doing, all of which it is capable to ameliorate this condition. Only a few brief references were made to the past, avowedly on the ground that it presented so little that was cheering and so much that was discouraging. These references, however, included an expression of opinion that experience with the new Pharmacopœia during the last twelve months has shown that it does not represent the advance made by pharmacy since the issue of the previous edition; a suggestion that pharmacists do not as a body do all that might be done towards improving pharmacopœial processes, or working out the history of little-known drugs before they get into the hands of the "mystery mongers," followed by a hope that the projected research laboratory may remove that reproach; and an allusion to the benefits resulting from international gatherings, *à propos* of the International Pharmaceutical Congress in Brussels last autumn. The President then proceeded to develop the main theme of his address, pausing by the way to utter, a little cynically, his reluctance to "throw a stone into so placid a pool of self-esteem," the subject being the necessity that the Conference should, if it desires to maintain its *raison d'être*, assume more active duties than it has hitherto done. Calling in

the fixity of physiognomy at recent meetings, and the increase in the number of papers read in the absence of authors and not followed by discussion, as evidence that the Conference is getting into a rut, the possibility of this being due to the absence of non-technical subjects from the discussions was suggested. Reference was then made to the fact that the address of the President of the American Pharmaceutical Association, which usually deals with more general topics, is handed over to a committee to consider such suggestions as it may contain and formulate any recommendations respecting them that may be desirable for report at a subsequent sitting of the same meeting of the Association. It was thus evidently implied that a similar course might be followed with advantage by the British Conference, and the hint, as will be seen, was taken in respect to one subject. The President then introduced his first course of "food for active thought."

The non-existence of pharmacy for pharmacists in provincial towns; the rare glimpses many apprentices get at a prescription; the slight distinction to be observed in many cases between the business available to a qualified chemist and druggist and that of a drysalter: these evidently played the part of condiments, but were not intended as the dish itself. The evils exist, and their pungency is only too evident; but the remedies for the irritation caused by them is not so obvious. Of course, the more complete separation of medicine from pharmacy suggests itself; but the time for this seems yet far off. In the President's opinion, legislation in this direction must not be expected, and he has more hope in the skill of the pharmacist intensifying the distinction between dispensing in a pharmacy and dispensing in a surgery, and in the improved education of the medical practitioner. But one evil with which the President of the British Pharmaceutical Conference thinks that body might grapple is what he defines as "wholesale prescribing for the medical profession." The "factory made" proprietary preparations which are perseveringly forced on the attention of the medical profession he looks upon as sapping the foundation of true pharmacy, and depriving the pharmacist of the legitimate practice of his calling. Without, therefore, discussing the therapeutic value of such preparations, he recognizes the continual prescribing of them by medical practitioners as indicating a want that pharmacists should lay themselves out to supply. He would therefore make it the business of the Conference, as soon as unofficial preparations of a certain type attain favor with the profession, to construct formulæ fairly representing them, and issue them as unofficial formulæ, which might be prescribed by medical men, with the addition of the letters "B.P.C." He believes that medical men would be willing, as it would be to their own interest, to prescribe preparations of a known composition rather than "nostrums" of which they know little or nothing, whilst it would then be within the power of every pharmacist to prepare such preparations within his own pharmacy.

Another dish of "food for active thought" provided by the President had reference to the still unsatisfactory and inadequate provision for pharmaceutical education in the provinces. It was pointed out that, notwithstanding all the labors of the past, pharmacists are still only very incompletely organized, and an opinion was expressed that the non-existence of suitable provisions for supplying the wants of pharmaceutical students was not so much due to the

insufficiency of the demand for sound education in pharmacy and the science allied to it as to the absence of adequate provisions for focussing the demand in such quantities as to ensure its supply. For the organization of such demand and supply it was proposed that Great Britain should be divided into about fifteen districts, each of which should be under the supervision of a representative local committee, having for its business, among other things, the establishment of one or more educational centres in the district, care being taken to utilize, so far as possible, any existing university or college teaching. Statistics were quoted to the effect that eight hundred candidates present themselves annually for the pharmaceutical examinations, of whom nearly four hundred pass, as evidence that there should be ample material for so limited a number of educational centres to draw upon to make most of them self-supporting. But supposing there were centres for which assistance could be legitimately expected, it was pointed out that the Council of the Pharmaceutical Society might well be called upon to fulfil the promises that it has made under successive presidents, to render assistance when there is satisfactory organization. Looking about for suitable constituents for such committees, Mr. Greenish thinks these might be found in the local secretaries to the Pharmaceutical Society in each district, who would not only form strictly local and representative committees, but would just give that contact with that Society which in view of a probable demand for pecuniary assistance the Council might fairly require. Moreover, it was pointed out that such organizations would be extremely valuable for other purposes, and it was significantly added that probably the next political struggle in which pharmacists would find themselves as a body engaged would be for the existence of present rights rather than the extension of present privileges. Recognizing the necessity for something more than empty declamation as to wants, Mr. Greenish then proceeded, with the aid of maps, to a description of the proposed divisions. From this it appeared that in England and Wales he suggests there should be twelve districts, and in Scotland three; the committees then, supposing that they included all the local secretaries in the respective districts, would in England and Wales, as a rule, number from twenty to thirty members, whilst in Scotland they would number about ten. Any approximate estimate as to the cost of carrying out such a scheme is of course out of the question without further inquiry; the figures quoted rather took the form of the outside possible cost to the Pharmaceutical Society, supposing it undertook the responsibility. Taking three hundred and fifty as the outside total under present arrangements, of the possible members of the committee, it was suggested that each committee might be limited in its expenditure for travelling, etc., to twenty shillings per head per annum, which would be covered by a sum of £350. Another estimate of £300 was arrived at by supposing that direct subsidies in aid of the classes might be required to the extent of an average of £20 for each district. The two sums would form a total of £650, which Mr. Greenish speculates might be somewhat reduced by local subscriptions to ensure interested supervision, and he suggests that the balance, possibly £500 a year, might be found by the Pharmaceutical Society. A sympathetic allusion to the late Mr. William Southall, then brought the address to a close.

It will be seen from the foregoing sketch that the Presidential address to the



British Pharmaceutical Conference this year offers ample material for discussion; but whether this will be taken advantage of it would be unsafe in the light of past experience to predict. On our part we express the hope that at least the recognized leaders in pharmacy, and especially those whose names have been associated in the past with the subject of provincial pharmaceutical education, will, as soon as may be practicable, express their opinions upon Mr. Greenish's propositions. In doing so it would be well to remember that, in respect to points of detail, these propositions are to be considered open to modification; so far as we understand Mr. Greenish's intention they are simply intended to form a nucleus for criticism. Whether there shall be fifteen or thirty divisions; whether the boundaries shall follow county or other recognized lines, or remain arbitrary as in Mr. Greenish's map; the persons who shall constitute the committees, and how much they are to be allowed to spend, are insignificant questions compared with the one, whether committees for organizing centres of education for definite districts shall be appointed at all. The advantage of the present position is that an idea that has been floating in many minds more or less definitely, and which has been more than once hinted at, has now been put into a concrete form that will allow of its proper discussion with a view to its adoption or final rejection. These remarks will apply with equal force to the question as to special preparations. The first thing to be determined is whether these subjects are to be dealt with at all on the broad lines indicated in the presidential address, and if this be answered in the affirmative the elaboration of the details would follow as a matter of course.

The novelty of the position, perhaps, may account for the address not having been dealt with at once exactly on the lines suggested; but immediately after a vote of thanks had been accorded to the President by acclamation, on the motion of Mr. Thompson, seconded by Mr. Arblaster, notice was given by Mr. Reynolds that he would bring forward a practical motion in respect to the special preparation question on Wednesday morning.

*Aconitine.*—The reading of papers was then proceeded with and notwithstanding so much had been written about aconitine, an interesting communication from Mr. Williams showed that the last word has not yet been said on the subject. In the first portion of the paper Mr. Williams described the process adopted by him in producing crystallized aconitine to meet the growing demand for it. The material used, he considers, should be derived from *Aconitum Napellus* only, care being taken to exclude the tubers from other species. The roots are not dried at a temperature sufficiently high to allow of being finely powdered, but a coarse powder is exhausted with 62° to 64° alcohol containing tartaric acid by a process of maceration and percolation. From the strong tincture the spirit is distilled off at the lowest possible temperature, and the residual thin aqueous extract is filtered through paper, which removes some resinous matter, then shaken up with ether, which removes some oily matter, and next treated with sodium carbonate, which precipitates the crude alkaloid. This is washed in moderately hot water, dried in the air, powdered and macerated in pure washed ether, from which it crystallizes on evaporation. It has been recommended by Groves, Wright and Mandelin that the base should be converted into nitrate as a means of purification. But although



admitting the facility which the nitrate presents for obtaining a crystalline product, Mr. Williams evidently doubts whether so delicate an alkaloid can escape alteration in contact with nitric acid, and thinks the probability of a change is indicated by the difference in the form of the crystallization of the base before and after conversion into nitrate and subsequent liberation. This point is at present the subject of physiological experiment. The paper was followed by an interesting discussion, opened by Mr. Groves, who somewhat pooh-poohed the probability of alteration being necessarily consequent upon the conversion of the base into a nitrate if common sense ruled the manipulation. Mr. Groves suggested the cultivation of some true *Aconitum Napellus* plants, with a view to more exact experiment, and the hazy knowledge existing in respect to the particular compound obtained from tubers of different botanical origin was adverted to by several speakers, the fact being emphasized by Mr. Holmes remarking that there are as many as twenty-four varieties of that species.

*Hymenodictyonine*.—Mr. Naylor then contributed another instalment to the chemical history of the bitter alkaloidal principle isolated by him from the bark of *Hymenodictyon excelsum*, used in India as a tonic. Some of the experiments now recorded consisted in attempts to obtain an iodine derivative of the alkaloid in a crystalline form; these, however, were unsuccessful, though an amorphous body was obtained which gave on analysis 47.52 per cent. of iodine, which corresponds pretty nearly with the formula  $(C_{21}H_{40}N_2) \cdot I \cdot 2HI$ . A similar failure attended attempts to obtain a crystalline bromine derivative. Other experiments had for their object to ascertain the effect of oxidizing agents on hymenodictyonine, the general result being an indication that like other non-oxygenated alkaloids it is constitutionally related to pyridine.

The time had now arrived for adjournment to luncheon, which was provided at the Grand Hotel.

*Elaterium*.—Upon resuming the first paper read was on the Assay of Elaterium, by Messrs. Jones and Ransom, which was partly devoted to the explanation of the defective nature of the method given in the Pharmacopœia and partly to the description of an improved method by which the determination of elaterin may be more correctly carried out.

*Pareira brava*.—The next paper, by Mr. William Kirby, had for its subject a false pareira brava from the West Indies. The histological peculiarities of this root as well as the stem were fully described, and will be illustrated when the paper is published. The reading of this paper gave the President an opportunity of reiterating his opinion as to the value of the microscope as a means of detecting intentional sophistication or the accidental substitution of one drug for another.

*Ulexine*.—The separation of an alkaloid, to which the name "ulexine" was given, from the seeds of the common furze, was announced by Mr. Gerrard a few weeks since (see this number, p. 489) but the method of preparation then described was defective and wasteful. Mr. Gerrard now states that it can be separated more effectively by treating the oily extract removed from the crushed seeds by alcohol with dilute hydrochloric acid, neutralizing the acid liquid with sodium carbonate, and after allowing resin to deposit adding excess of caustic soda,

and shaking the alkaloid out with chloroform; upon treating the chloroformic liquor with dilute hydrochloric acid and evaporating ulexine hydrochlorate is obtained in crystals. The free base is separated in a crystalline form by decomposing the purified hydrochlorate in aqueous solution with soda, shaking it out with chloroform and evaporating. The yield of ulexine from the seeds by this process was only 0.191 per cent.; the alkaloid has also been obtained from the bark and young tops of furze, but in still smaller proportion. Ulexine is described as being soluble in its own weight of water, but quite insoluble in ether. It readily forms crystalline salts, and these, as well as the base, are said to give a characteristic deep red color with ferric chloride. Mr. Gerrard devoted a paragraph to the galenical preparations of furze, but probably this information may, without disadvantage, await the publication of the paper.

*False cubebs.*—In some notes on the chemical examination of the fruit of *Daphnidium Cubeba*, which were epitomized by Mr. Umney in the absence of the authors, Messrs. Braithwaite and Farr described the results of their experiments with the several extracts obtained by treating the material successively with petroleum spirit, ether, alcohol and water. They succeeded in ascertaining the presence of rather more than one per cent. of a volatile oil, and a considerable amount of fat oil containing oleic, capric and lauric acids, together with resinous substances presenting characters analogous to those of alkaloids and glucosides, but owing to the want of sufficient material these constituents could not be thoroughly studied. A sample of the oil which was shown differed markedly in odor from the oil of genuine cubebs, resembling pretty closely in this respect oil of lemon grass.

*Citrate of iron and quinine.*—The last communication read on Tuesday consisted of notes on the examination of some trade samples of this compound, by Mr. F. H. Alcock. The samples, six in number, which were described as "typical representatives of B.P. kind," were examined in respect to solubility, amount of ferric oxide, alkaloidal constituent and sulphate present. Only one sample was represented as coming up to the B.P. standard in containing 15 per cent. of alkaloid, and this sample also gave the best result in respect to solubility, but it contained as much as 1.812 per cent. of sulphate. This quantity of sulphate was exceeded in two other specimens, and suggested the possibility that quinine sulphate had been added directly in their preparation. In the discussion which followed this paper, Mr. Umney expressed an opinion, which met with a general affirmatory response, that citrate of iron and quinine which does not answer to the present official requirement in containing 15 per cent. of quinine is improperly made, and is a disgrace to pharmacy.

After this discussion the Conference adjourned until Wednesday morning. A very pleasant sequel to the day's proceedings was arranged by the local committee, which had provided a number of brakes, some of which conveyed a party of members to the Mint, where ample opportunity was given for seeing the process of minting coins of copper, bronze, nickel and brass, from the melting of the alloy to the striking of the coin. Another party meanwhile visited the exhibition, and at 6 o'clock, having rejoined, the whole of the members were taken for a beautiful drive into the southern suburb of Birmingham.

*Studies in botany and materia medica.*—On Wednesday morning, Professor Hillhouse, of Mason's College, read a paper in which he showed that for the sake of ensuring thoroughness in the study of botany and materia medica these subjects should be taught with a suitable regard for and co-ordination with the study of other branches of science, which, like physics, chemistry and physiology, deal with the same subject matter from different points of view, and also with due regard for the practice of those arts, which, like medicine and pharmacy, require a knowledge of drugs and their composition and effects. He pointed out that the study of botany is with the pharmaceutical student largely a means to an end, namely, the systematic and intelligent study of some portion of the heterogeneous subject known as materia medica, and his object was to suggest how the study of botany might be best directed towards eventually qualifying the student for that work. Under the conjoint system adopted in reference to medical education, Professor Hillhouse considers that this correlation of different branches of science has not been sufficiently regarded, since the teaching of a branch of knowledge which most persons would consider to be dependent on prior chemical and botanical training is to be deprived of its botanical side, while the period assigned for teaching therapeutics is limited to the first year of the student's career. Although pharmaceutical study is still without any definite regulation the considerations treated of by Professor Hillhouse are well worthy the attention of all who hope to see that deficiency removed, and from the rapid progress of science in all directions it becomes especially important from a practical point of view so to adjust the teaching of the different branches that time may be economized, and with regard to the specific object of the course of study the teachers may, to use Professor Hillhouse's words, "play into each other's hands." The first part of the discussion which followed the reading of this paper referred to the subject from a medical point of view, Dr. Trimen, for instance, differing materially from the author and speaking of the absurdity of professing to arrange a complete course of botany that would be suitable to the conditions of the medical student. Mr. Holmes, Mr. Martindale, Mr. J. C. Shenstone and others, however, brought the question back within pharmaceutical range and argued that the teaching of botany to pharmaceutical students should be made more practical than it is at present.

*Unofficial formulary.*—The next business transacted by the Conference involved an innovation which will probably distinguish this from every other meeting that has preceded it. It will be remembered that in his address the President suggested that the Conference might undertake the task of compiling a non-official formulary. Mr. Reynolds now moved a resolution which practically covered this suggestion, the exact words being, "that in order to secure greater uniformity of composition and strength in non-official remedies, and also to enable the medical profession to prescribe them with definite knowledge of those qualities, and without indicating any particular maker, the British Pharmaceutical Conference undertakes the preparation of a Formulary of Non-Official Remedies." This proposition was supported by a reference to what had been done by the Paris Pharmaceutical Association, and was seconded by Mr. S. R. Atkins. It was evidently in accord with the views of nearly all present, although the discussion made it apparent that a diversity of opinion existed as to the scope of

the proposed Formulary, some speakers wishing to limit it to formulæ for preparations of newly introduced drugs, and others evidently desiring that it should extend to the class of preparations represented by the illustration quoted by the President. One argument that told strongly in support of the motion was that it would give pharmacists an opportunity of proving their capability of rendering assistance in pharmacopœia construction. Eventually the resolution was passed *nemine contradicente*, and then, in order to give it practical effect, Mr. Williams moved the appointment of a committee consisting of Messrs. Greenish, Groves, Martindale, Symes, Thresh, Martin, Naylor, Maben, Abraham and Reynolds, with power to add to their number, to prepare a Formulary of Non-Official Remedies and to report to the Executive Committee, the sum of £25 being placed at the disposal of the Committee for expenses. This motion was also carried.

*Nux vomica*.—The reading of papers was then resumed, the next in order being a valuable communication by Mr. N. H. Martin, of Newcastle, in which he gave the results of the examination of a large number of preparations of *nux vomica*, obtained from various sources, undertaken with a view to ascertain to what extent the new Pharmacopœia processes are followed in making these preparations, and whether the object sought in fixing an official standard is attained by these processes. Out of 25 samples of tincture of *nux vomica* 11 were separated as presenting evidence by their color of having been prepared direct from *nux vomica* seeds; the alkaloidal strength of these samples ranged from .119 to .288 per cent., 7 of them being below the official standard. The 14 samples that appeared to have been prepared by dissolving the extract in a mixture of spirit and water, ranged in alkaloidal strength from .196 to .313 per cent., no less than 10 of them being in excess of the official strength and some considerably so. Mr. Martin is therefore of opinion that uniformity of alkaloidal strength is not attained by the Pharmacopœia process, even when it is followed, and that the tendency towards excessive potency may be attended by danger and inconvenience. Only 4 samples of extract had been examined which varied in alkaloidal strength from 15 per cent. of total alkaloid to 16.8. But Mr. Martin's principal objection is that as there "exists no relation between the amount of extractive and the amount of total alkaloids in any samples of *nux vomica*," the Pharmacopœia process practically results in a preparation which is in such an unstable condition that to call it a standardized preparation misleading. The variation in the consistency of the standardized extract was confirmed in the discussion that followed the paper, by Mr. Conroy and others.

*Ethyl nitrite*.—Mr. John Williams then read a note on the preservation of ethyl nitrite, in which he stated that in continuing his endeavors to prepare a solution of ethyl nitrite which would not decompose by keeping he had found the use of glycerin gave very promising results in preventing the rapid decomposition of nitrous ether as well as hydrocyanic acid, and he promised on a future occasion to report how far his expectations were realized. He exhibited samples of glyceric-alcoholic solutions containing 17 per cent. of ethyl nitrite and less. Upon pouring the stronger solutions into water more or less violent effervescence was caused by the escape of the gaseous nitrite, the highest strength



with which effervescence did not take place being the solution containing 2½ per cent.

The Conference then adjourned for luncheon.

*Belladonna liniment.*—Upon resuming, the last sitting commenced with the reading of a paper which might be looked upon as a criticism from a manufacturer's point of view of the new Pharmacopœia process for making belladonna liniment. In making the liniment strictly according to the official directions Mr. Ransom has found that in order to obtain the 30 fluid ounces of final product 54 ounces of rectified spirit had to be used; further the fineness of the powder proved inconvenient when working on a large scale. The process was therefore varied by percolating a No. 20 powder until 40 fluid ounces of spirit had been used and then pressing the marc. In this way 30 ounces of liniment were obtained of almost identical alkaloidal strength with that prepared by the official process, but with a saving of 14 fluid ounces of spirit. Some other experiments were directed to testing the statement made in a footnote to the process in the Pharmacopœia of 1885 to the effect that improved exhaustion requires the increase of spirit as compared with the quantity ordered in the previous edition. Practically it was found that the liniments prepared by the two processes were equal in alkaloidal strength. The next point sought to be determined was the extent to which by the present official process for belladonna liniment the alkaloids are removed from the root. It was found that the exhaustion was far from complete, being 71 per cent. of the total alkaloids in one case and 63 per cent. in another, but that the exhaustion was more complete from the richer root. The experience of the author leads him to favor the standardizing of this preparation. Mr. Ransom also criticizes the official description of the root as favoring the omission of young roots which are relatively rich in alkaloid.

*Salol*, or salicylate of phenol, a new antiseptic which is attracting considerable attention just now, was the subject of a communication from Mr. J. Moss. The first portion of the paper was devoted to the useful purpose of a *réchauffé* of the description of this compound and the claims that have been put forward on its behalf. Most of this information was practically the same as appeared in previous notes. (See August number, p. 380). It was further mentioned that Professor Von Nencke's supposition that the decomposition of salol in the duodenum after passing unaltered through the stomach is due to the pancreatic ferment is incorrect, it being in fact due to the alkalinity of the liquid. Mr. Moss has indeed found that the saliva is sufficiently alkaline, though of course only to a small extent. The latter part of the paper recorded the author's failure to manufacture the compound.

*Terebene.*—The next two papers read were on the subject of the quality of so-called "pure terebene." The first, which was by Mr. W. Lascelles-Scott, gave the results of the examination of fifteen samples, from which it appeared that he considered only two samples were entitled to be spoken of as good, most of the others giving indications of having undergone oxidation by formation of peroxide of hydrogen and consequently yielding on evaporation various quantities of resin. One sample which was credited with having caused a cutaneous eruption gave as much as 2·10 per cent. of resin. The second paper, by Mr. John Hodgkin, dealt with the impurity of "pure terebene" as indicated by the polarimeter. Proceeding upon the assumption that American turpentine is usu-



ally used in the preparation of terebene and taking  $18^{\circ} 6''$  as the standard of rotation of this variety of turpentine, Mr. Hodgkin based his calculation as to the amount of unaltered turpentine in a sample upon the extent of its rotatory power, an essential character of pure terebene being, as is known, its absence of any effect upon a beam of polarized light. Nine samples, two of which were foreign, gave results indicating the presence of unaltered turpentine, calculated upon this assumption, varying between 3.2 and 61 per cent. of unaltered material. One of the samples giving the best indications according to this test was described as having "a slight smell of turpentine," whilst another sample said to have a "pleasant" odor gave indications construed to show the presence of 32.9 per cent. of unaltered turpentine. It was objected to this test that American turpentine is not constant in its rotatory power, but Professor Armstrong remarked that the variety showing the greatest deviation from the standard comes from Savannah and is relatively small in quantity, so that, on the whole, American turpentine is fairly uniform in this respect. Some little amusement was caused when, upon Mr. Moss stating that he had based his process for the manufacture of terebene upon the published researches of Messrs. Armstrong and Tilden, Professor Tilden declared that the outcome of their research was to prove that no definite body corresponding to that originally described as terebene existed; but the apparent contradiction will be understood in the light of a remark by Mr. Allen that the name was applicable even if it were only to a mixture of hydrocarbons obtained by the molecular modification of turpentine until it no longer was capable of exercising a rotatory power on polarized light.

*Emetine*.—In some notes on the estimation of emetine, Mr. H. W. Jones spoke favorably of Flückiger's method for assaying ipecacuanha, which consists in exhausting the finely powdered root with chloroform containing a trace of ammonia (see *Am. Phar. Journ.* 1886, p. 127), and weighing or titrating the residue after evaporation. The author stated that the alkaloid is removed in this way in an unaltered condition, but he agreed with Mr. Alcock (*Phar. Jour.*, xvi.), that the chloroformic residue is only imperfectly soluble in acidulated water, and said he therefore preferred to treat it with water and dilute sulphuric acid, filter through cotton wool and recover the alkaloid with chloroform and ammonia. In respect to the titration with Mayer's reagent, by experiments with pure emetine Mr. Jones has found that in faintly acid solutions the most exact indications are given when the dilution is in the proportion of about 1 in 530; but as the error appears to increase regularly with the degree of concentration, he has constructed a table of factors for correction of results. Mr. Jones also corroborates the opinions which have been expressed that the amount of emetine in good ipecacuanha does not greatly exceed 1 per cent., and attributes higher results that have been recorded to the action upon the reagent of substances other than emetine that have been taken up by the solvent employed. Other experiments referred to, went to show that emetine undergoes alteration in treatment with lime, or even when subjected to heat alone on a water bath, increasing slightly in weight, and then giving in acidulated water highly colored solutions.

*Vinum ipecacuanhæ*.—A paper, by Mr. J. C. Shenstone, gave the results of some experiments made to compare the behavior of samples made with natu-

ral wines with and without various additions, and with artificial substitutes of known composition. The experiments have not afforded very decisive indications, beyond confirming the generally received opinion that the changes in the preparation are brought about by constituents in the wine used as well as atmospheric oxidation. The presence of sugar and of glycerin appeared to exercise a retarding influence on the precipitation, and Mr. Shenstone suggests a formula in which wine is replaced by a corresponding quantity of alcohol and water, with the addition of 10 per cent. of glycerin and 0.5 per cent. of malic acid.

A variety of musk derived from the "musk rat" (*Fiber Zibethicus*) has been the subject of various notices in Canadian and United States journals during the last few years (see *Amer. Phar. Journ.*, 1881, p. 397), and has been suggested as a possible substitute for the more expensive variety of musk for various purposes in perfumery. Dr. Symes reported to the Conference the result of an examination of some of this American musk, from which it appeared that as at present met with it had the disadvantage of being contaminated with matter having a rancid odor, but it was suggested that this might perhaps be avoided by proper precautions taken at the time of collecting the musk. Dr. Symes also described a process for exhausting the pods of their odor.

*Iodoform.*—The remaining four papers were then briefly summarized by the honorary secretaries in the absence of the authors. A note by Mr. Dott on iodoform was a defence of a statement made by him last year as to the extent of the volatility of iodoform, which has been questioned by Dr. Vulpinus. Mr. Dott reiterates his statement that the average volatilization of iodoform at 100° C. amounts to 6.7 per cent. per hour, and appears to think that the different result mentioned by Dr. Vulpinus was probably obtained at the more indefinite and lower temperature of a water-bath.

*Cinchona.*—In the next paper Mr. David Hooper communicated some of the results obtained in the course of his quinological work in the Madras cinchona plantations. Shaving cinchona trees as a method of harvesting bark is now very general, but the question as to the limit to the constant and successful shaving of the tree is not yet fully understood. It has been found that when operating on trees of six years old the increase in the amount of quinine during the first and second renewal at intervals of twelve months was most satisfactory, but the increase was not so marked in the third year renewal, although the conclusion arrived at is that renewal by shaving might be permitted for at least four years. The beneficial effect of renewal by shaving was very marked in the case of a six-year old *succirubra*, which yielded twice as much quinine sulphate as from a natural *succirubra* of twice that age; but the operation was not satisfactory in its results when applied to trees of sixteen to twenty-one years, as such old trees will not bear the shaving treatment. The application of cattle manure to cinchonas seems, from the results of three sets of experiments on *succirubra* and *magnifolia* trees, to have the effect of increasing the amount of total alkaloids, and in two instances the amount of quinine, by 52 per cent. and 20 per cent. respectively; but the usefulness of the application of manure was not so marked in old trees, and it is believed that the effect of manuring would be more apparent in Crown and Ledger barks. It is also stated that the maximum yield of quinine in Ledger and *succirubra* barks seems to be attained when

the trees are between the age of five and six years, as after that time there is no sensible increase in the amount of quinine. Another point ascertained was that bark which had been kept for ten months in a damp room, and had become mouldy in consequence, had not deteriorated as regards the amount and quality of the alkaloids.

*Cinchona cultivation* in South America was the title of a paper by Mr. David Howard, who believes that it is to other countries than Ceylon, which occupies at present the most prominent position of all the countries where cinchonas have been cultivated, that we must look for the solution of the scientific points involved in the cultivation of cinchonas, owing to the little care that has been taken in Ceylon to avoid the danger of hybridization. Unfortunately, very little scientific information can be obtained from South America, the natural home of the cinchonas, except what little can be derived from the study of the cultivated bark which reaches us from that country. Among the cinchonas under cultivation in South America are two new species, *C. Thomsoniana*, named after Mr. Thomson, who discovered it in the Central Cordilleras, the home of the well-known *C. lancifolia*, and another discovered by Señor Pombo in Ecuador. *C. Thomsoniana* gave an analysis of the bark of a two-year old tree 3.3 per cent. quinine sulphate, trace of cinchonidine, and 0.55 per cent. cinchonine. The bark from the other species of the same age gave 5.7 per cent. quinine sulphate, 0.43 per cent. cinchonidine, with no cinchonine or quinidine. The improvement brought about by the successful cultivation of the cinchonas is further shown by the results obtained from the same plantations in 1872 and 1881 of the several kinds of cinchonas grown in Jamaica, and these results were even more favorable in the cultivation in Columbia of descendents from the Jamaica plantations. In the case of a succirubra cultivation in Columbia from a Jamaica plant the bark yielded as much as 7.0 per cent. quinine sulphate, with only 1.9 per cent. cinchonidine, and 0.67 per cent. cinchonine, and Mr. Howard remarks that this succirubra is one of the finest he has tested. In Mr. Howard's opinion it cannot be too clearly borne in mind that the prospect of future profits in the cultivation of cinchonas depends entirely on the cultivation of the high testing bark, for in the face of the importation of such highly valuable cultivated bark from Bolivia, as well as from Java, the profitable growing of inferior bark is impossible.

*Compound spirit of ether.*—The next paper was a characteristic note by Mr. Dott on this preparation which has recently received an official rehabilitation; it wound up with the following not very complimentary conclusions:—(1) That the Pharmacopeia directions for its preparation admit of a very variable result; (2) that the process consists principally in the preparation of ether, and its evaporation into space; (3) that though this extravagance could not be grudged if it resulted in a product of extraordinary potency, there is no evidence to show that ethyl sulphate or its congeners are of such a nature; and (4) that the introduction of this preparation appears to be a step backwards.

The business of the Conference having been so far concluded, resolutions of thanks were passed to the local committee, to the officers and professors of Mason's Science College, to the retiring general secretary, Mr. Plowman, and to the president.

The election of officers for the ensuing year was decided by the presentation of a single ballot paper, and no opposition having been offered it was declared to have been completed, the President chosen for next year being Mr. S. R. Atkins, of Salisbury.

The other members of the executive committee are—

*Vice-Presidents*, M. Carteighe, F.I.C., F.C.S., London; S. Plowman, F.R.C.S., London; C. Symes, Ph.D., Liverpool; G. S. Woolley, Manchester.

*Treasurer*, C. Umney, F.I.C., F.C.S., London.

*Honorary General Secretaries*, J. C. Thresh, D.Sc., F.C.S., Buxton; W. A. H. Naylor, F.C.S. London.

*Other Members of Executive Committee*, W. Elborne, Manchester; A. W. Gerard, F.C.S., London; T. Maben, Hawick; J. E. Brunker, M.A., Dublin; R. H. Davies, F.I.C., F.C.S., London; D. B. Dott, F.R.S.E., Edinburgh; T. Barclay, Birmingham; M. Conroy, F.C.S., Liverpool; W. H. Symonds, F.C.S., F.R.M.S., London.

*Local Secretary*, F. B. Bengier, F.C.S., Manchester.

*Auditors*, C. J. Arblaster, Birmingham; W. Wilkinson, Manchester.

Incidentally it was mentioned that the attendance at the Birmingham meeting had been larger than at any previous meeting of the Conference, no less than 187 members' names having been recorded on this occasion, while the actual number of visitors present was probably much in excess of two hundred, so that the varied attractions of the Midland Metropolis as a place of meeting were evidently well appreciated.

At the close of the proceedings on Wednesday afternoon, conveyances were again prepared to take the members to Gillott's Steel Pen Works, and a large number availed themselves of this opportunity of inspecting one of the most interesting industries of Birmingham. Another party went to the exhibition at Bingley, and afterwards they drove to the Botanical Gardens. In the evening there was a musical and social meeting at the Grand Hotel, and festivities were kept up until an advanced hour in the night.

On Thursday, September 2, an excursion was had to Stratford-on-Avon, Leamington, Warwick and other points of interest in Warwickshire.

We cannot close these remarks without again calling attention to the conversazione, held on Monday evening, as having proved a very happy innovation upon previous usage. The greater facilities thus afforded for personal intercourse between the members are of especial value in regard to the objects which the Conference has in view, and it would be desirable if possible to make those facilities for conversation even greater still. It might indeed be useful for that purpose to curtail the periods of meeting now devoted to the reading of papers, and many papers might be read in a more abbreviated form for the purpose of employing some of the time available in the more profitable manner we have mentioned.—*Phar. Jour. and Trans.*, Sept. 4, 1886.

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**Isocicutine.**—Bochefontaine (*Medical Chronicle*, June, 1886), has observed that its action on frogs closely resembles that of curare, and that warm-blooded animals die with symptoms of respiratory paralysis. It has not yet been used therapeutically.



## PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

*Philadelphia College of Pharmacy.*—The readers of the JOURNAL will remember that only five years ago (See *AMER. JOUR. PHAR.*, 1881, pp. 258 and 374) this College, then enlarging its buildings, built a new chemical laboratory to meet the necessities of the class work. The increasing demand for space, particularly on the part of advanced students, has led the trustees of the College to make, during the past summer, extensive additions. Appropriating a three-story building belonging to the College, they have remodelled, enlarged and connected it with the present laboratory.

On the ground floor there are, 1st, a well lighted quantitative laboratory, fitted with water and gas for each table, vacuum pumps and special tables for organic analysis and distillation; 2nd, a commodious balance room, and 3rd, a fume closet, provided with conveniences for evaporation, distillation, &c.

On the second floor are, 1st, a reagent room, provided with shelves for all classes of chemicals; 2nd, a waiting room and retiring room for the female students, a number of whom are availing themselves of these laboratory facilities. On the third floor is a room for the storage of glassware and other apparatus.

The whole building is independently heated by a furnace in the cellar, and ventilation and drainage have been carefully provided for.

The erection of this building is largely in answer to a demand for laboratory facilities for women, many of whom have shown a desire to pursue plant analysis and other lines of advanced chemical work; the provision is, therefore, primarily for them. At the same time it allows of the pursuit of special investigation on the part of advanced students from the other laboratory. It is hoped from time to time to present the readers of the JOURNAL with the results of work done in this new laboratory.

The first apprentice examination (see August number of the JOURNAL) was held September 15th, when four of the applicants were deemed qualified to enter upon the study of the art of pharmacy. It is the intention to hold such examinations whenever a sufficient number of applicants have applied. Blank forms for application and further information may be obtained from the Actuary of the College.

*The Chicago College of Pharmacy* has announced that for the ensuing course of instruction, complete tickets will be furnished to students for the sum of fifty dollars, which includes all the laboratory instruction during the course 1886-1887.

*The Cincinnati College of Pharmacy*, at its meeting held August 10th, has ratified an arrangement made with the Cincinnati University, to become the Pharmaceutical Department of said University. The College retains its name and the control of its own affairs the same as before, and gains the advantage that its students have the right to receive instruction in any



branch taught in the academic and scientific departments of the University, for which they are prepared, free of charge.

*School of Pharmacy of the University of Michigan.*—Alviso B. Stevens, Ph. C., has been appointed for the lectures on pharmacy, following the resignation of Assist. Prof. T. J. Wrampelmeier. Mr. Stevens is well known as a pharmacist at 33 Lafayette Avenue, Detroit; graduated in pharmacy at Ann Arbor in 1875; was President of the Detroit Pharmaceutical Association for several years after its organization, and is one of the officers of the Michigan State Association.

*The North Carolina Pharmaceutical Association* held its seventh annual meeting August 11th and 12th, in Library Hall in Fayetteville. The address of the retiring president, H. R. Horne, and the reports of officers, committees and of the State Board of Pharmacy were presented and discussed. Resolutions were passed favoring the election of the Board of Pharmacy by the Association; in favor of placing the financial affairs of this Board into the treasury of the Association, and in favor of a rebate by the government on alcohol used in medicine or the arts, and of the abolition of the special tax as liquor dealers on druggists who sell alcohol only.

In a paper read by Mr. Nadal, a formula for elixir of pyrophosphate of iron, quinine and strychnine was given; and Mr. Calloway read a paper giving the results of the assay of various samples of *Fowler's solution*, showing deficiency of arsenical strength in several which in some cases appears to be due to the presence of calcium sulphate as an impurity in commercial white arsenic; it is advised that this preparation should always be made by the apothecary.

Mr. A. W. Rowland, of Wilson, was elected president; F. W. Hancock of Newberne, B. E. Sedberry of Fayetteville, and J. D. Croom of Shoeheel, vice-presidents; J. C. Munds of Statesville, secretary; and A. S. Lee of Raleigh, treasurer. The next meeting will be held in Asheville on the first Wednesday of August, 1887; W. C. Carmichael, local secretary.

*The Tennessee Pharmaceutical Association* was organized at Nashville, August 10th, adopted a constitution and by-laws and elected, for president, B. H. Gordon, Nashville; vice presidents, F. W. Scruggs, Memphis, and J. A. McCampbell, Knoxville; secretary and treasurer, J. T. Lellyett, Nashville. Various committees were appointed, and steps were taken for contesting before the Supreme Court a decision of Chancellor Merritt, requiring all druggists to take out a liquor dealer's license of \$350 per annum; also, for having the "special merchants' license act" of 1882 so modified by the Legislature as to relieve those druggists who confine themselves to the sale of liquors for medicinal purposes. The next meeting will again be held in Nashville.

*The Wisconsin Pharmaceutical Association* met at its seventh annual meeting in Fond du Lac, August 11th, and listened to an address by the mayor, the annual address by the retiring president Prentice, and the reports of

the officers and committees, among the latter one from Professor Power, on "Adulterations." A number of papers were read and discussed. The officers for the ensuing year are: F. M. Givens, Fond du Lac, president; R. D. Pulford, Mineral Point, and W. M. Edwards, Portage, vice presidents; W. P. Clark, Milton, treasurer, and E. B. Heimstreet, Janesville, permanent secretary. The next meeting will be held at Milwaukee on the second Tuesday of August, 1877; A. Conrath, local secretary.

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### OBITUARY.

In three weeks the Philadelphia College of Pharmacy lost two of its faithful members. Wm. C. Bakes, Ph.G., class 1855, died August 29th, in Ocean Grove, and Dillwyn Parrish, Ph.G., class 1830, died in Philadelphia, September 18th. The Committee on Deceased Members will doubtless report more fully upon their services; for the present we note in the following the action taken by the Board of Trustees:

This Board having learned with deep regret of the decease, on the 29th of August, of their fellow-member and secretary, WILLIAM C. BAKES: Therefore,

*Resolved*—That we place on record our sense of the loss sustained by us and by this College in the death of our fellow-member. Mr. Bakes has served this Board for a long course of years as its secretary, filling the position with faithfulness, and to the entire satisfaction of its members. The zeal and energy manifested by him in the performance of the duties assigned to him; his judgment ripened by long experience in conducting the commencements and other public duties assigned to him were so well appreciated, that we reposed in confidence on his management on such occasions. So identified did he feel with this Board from long participation in its membership, that he continued his services as secretary after removing to Ocean Grove, although his labor and loss of time was much increased thereby. While called upon to mourn the loss of a valued member and friend, in the prime of life, it is with gratification that we can turn to his record as one which will do honor to his name and memory.

The members of the Board of Trustees of The Philadelphia College of Pharmacy, assembled in special meeting to-day, September 20, to consider the propriety of an expression of feeling upon the death on September 18th, of DILLWYN PARRISH, late president, and life-long member of this College: *Do resolve*—To have placed upon the records of the College a sense of profound sorrow, and of the high and generous esteem with which we valued his counsel, and his personal association. Possessing in a marked degree, all those traits which gave greatest value to human character, he impressed their influence upon his connection here and upon us.

Eminently discreet and wise in all his views governing the policy of this institution, he, in common with other esteemed counsellors, (the majority of whom have now passed from life) has given to The Philadelphia College of Pharmacy, a name, honored and distinguished among the institutions of this country.